A reference for Supreme Audit Institutions to understand basic concepts of disaster/emergency preparedness besides government's efforts, policies, and funding mechanism to prepare for disasters and examples of audit assignments on the issues

INTOSAI

Disaster Preparedness

for

SUPREME AUDIT INSTITUTIONS

A Reference for the Rest of Us

ACKNOWLEDGEMENT

The research has also identified that the current ISSAI 5500 series did not discussed about the audit of government readiness for emergency situation. Therefore, we recommend that it will be better if we put some degree of attention to discuss this specific topic in the ISSAI or other INTOSAI documents. Moreover, communicating and incorporating the results of the research project to project leader of FIPP's Project 2.10 on consolidating and aligning the audit of disaster-related aid with ISSAI 100 will be beneficial.

Pursuant to KSC's document on Quality Assurance of INTOSAI Public Goods that are Developed and Published Outside Due Process, the activities to prepare the research project comprise (a) preparation of project initiation document, (b) circulation the proposal around project members for comment, (c) studies in the literature related to disaster/emergency preparedness issues, (d) preparation of country paper to collect data and information, (e) examination of audit reports, (f) drafting the paper, (g) discussion the case studies with the Disaster Research Center of Gadjah Mada University, (h) distribution of the draft to the INTOSAI Community for comments, and (i) finalization of the draft.

The Audit Board of the Republic of Indonesia took the initiative to lead this project to show our commitment on supporting KCS's project in particular, and in supporting SAIs and their respective government to be more prepared to cope from disasters, and thus the trully value and benefit of SAIs can be felt by the stakeholders, including the local and community. Therefore, we are very grateful to the SAIs which replied to our surveys and other members of INTOSAI Community for their contributions and assistance.

We must acknowledge that our commitment and untiring joint efforts throughout the project are concrete evidence of our cooperation in supporting the world to be more resilient to disasters and will be a milestone towards the success of such KSC project.

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ACRONYMS AND ABREAVIATIONS

BNPB	*Badan Nasional Penanggulangan Bencana (National Disaster Management Agency in Indonesia)*
BPBD	*Badan Penanggulangan Bencana Daerah (Local Disaster Management Agency in Indonesia)*
FEMA	*The Federal Emergency Management Agency*
GIS	*Geographical Information System*
IAEA	*International Atomic Energy Agency*
IDMC	*Internal Displacement Monitoring Center*
INTOSAI	*The International Organization of Supreme Audit Institutions*
IPCC SREX	*Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation published by Intergovernmental Panel on Climate Change*
KRB	*Kawasan Rawan Bencana (hazard zones)*
NGO	*Non Government Organization*
RPB	*Rencana Penanggulangan Bencana (Disaster Management Plan)*
SAI	*Supreme Audit Institution*
SDGs	*Sustainable Development Goals*
UK	*The United Kingdom*
UNISDR	*The United Nations International Strategy for Disaster Reduction*

CHAPTER 1

INTRODUCTION

1.1 Common phenomenon leading to disasters and their impact

Disasters have always been present in human history. History records disasters that have happened in the past and provides us with lessons on those that will happen in the future. However, the world has reacted, and since the Second World War, governments have created acts to reduce and prevent disasters.

This is because when disasters strike a geographical location, they tend to disproportionately alter the social fabric leading to widespread damage and losses of lives and resources. Today, our populations and communities have even become increasingly vulnerable to disasters and this has been aggravated by some issues, such as rapid environmental degradation, climate change, as well as poverty, lack of safety nets, and so on.

Disasters even have a devastating impact on development. Families lose homes and livelihoods; communities and nations lose businesses, jobs and services; children miss school, impacting a generation. Over the past twenty years, disaster impacts are already at extremely high levels. The World Bank reported that losses from disasters had increased rapidly, rising from $50 billion a year in the 1980s to nearly $200 billion a year in the last decade. According to IPCC SREX report, disasters from natural hazards themselves have affected 4.4 billion people, claimed 1.3 million lives and caused $2 trillion in economic losses – and will worsen by 2030. It is even claimed that global average annual loss from disasters is estimated to increase from an annual average of $260 million in 2010 to $414 billion by 2015 (UNSIDR, 2015).

The World Bank's Shock Waves: Managing the Impact of Climate Change on Poverty report finds that almost 75 per cent of the losses are attributable to extreme weather events, and climate change threatens to push an additional 100 million people into extreme poverty by 2030. Besides, population growth and rapid urbanization are driving the increase in disaster risks. According to the Bank's Investing in Urban Resilience report, by 2030, without significant investment into making cities more prepared and resilient, disasters may cost cities worldwide $314 billion each year.[1]

On the other hand, disasters act as great levelers defying all existing social differences and stratifications, affecting all, but in a unique way, unifying the communities across boundaries. And, thus, creating necessities for people who live in high risk places to reduce disaster risk and prepare for those disasters. This was clearly recognised in The Future We Want which called for 'disaster risk reduction and the building of resilience to disasters to be addressed with a renewed sense of urgency in the context of sustainable development and poverty eradication' (para 186).

1.2 Key terms

Disaster: A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources. A disaster is a function of the risk process. It

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[1] http://www.worldbank.org/en/topic/disasterriskmanagement/overview downloaded on February, 10, 2018

results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk (ISDR 2017).

There are many definitions for a disaster. Different organizations may have slightly differing definitions. Still, the following are fundamental components accross all definitions. A disaster

- is a severe event,

- causes damage to infrastructure, economic and social structures, or human health, and

- requires external assistance.

Disasters can result from natural hazards or from human-related activities. Therefore, disasters are typically classified into distinct categories based on the cause of the hazard as either natural or human-induced (man-made)[2].

An emergency is an event or situation which threatens serious damage to human welfare in a place and to the environment of a place, or war, or terrorism which threatens serious damage to security requiring implementation of special arrangements by one or more category responders (UK Civil Contingency Act 2014).

Emergency is sometimes used interchangeably with the term disaster, as, for example, in the context of biological and technological hazards or health emergencies, which, however, can also relate to hazardous events that do not result in the serious disruption of the functioning of a community or society (ISDR 2017).

Hazard: A process, phenomenon or human activity that may cause loss of life, injury or other helath impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socionatural in origin. **Natural hazards** are predominantly associated with natural processess and phenomena. Anthropogenic hazards, or human-induces hazards, are induced entirely or predominantly by human activities and choices. Several hazrads are **socionatural**, in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change. Hazards include biological, environmental, geological, hydrometeorological and technoloical processess and phenomena (ISDR 2017).

Multi-hazard: (1) The selection of multiple major hazards that the country faces and (2) the specific contexts where hazardous events may occur simultaneously, cascadingly or cumulatively over time, and taking into account the potential interrelated effects (ISDR 2017).

Disaster Management: The organization, planning and application of measures preparing for, responding to and recovering from disasters (ISDR 2017). Disasters do not just appear one day — they may exist throughout time and have a life cycle of occurence. This cycle is matched by a series of management phases: establish strategies to mitigate hazards, prepare for and respond to emergencies, and recover from effects. Prevention/Mitigation and Preparation relate to the preventive and preparatory measures which government can establish and operate in advance of potential disaster. Meanwhile, Response and Recovery (which consists of Rehabilititation and Reconstruction) describe the activities which follow the occurence of disaster.

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[2] Ifrc.org.Types of a Disaster: Definition of Hazard website. Available from: http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/definition-of-hazard/

Mitigation: refers to the structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation, and technological hazards and to ensure the ability of at-risk communities to address vulnerabilities aimed at minimizing the impact of disasters.

Preparedness: is the ability of governments, professional response organizations, communities and individuals to anticipate and respond effectively to the impact of likely, imminent or current hazards, events or conditions, the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters (IASC, 2011).

Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning; the stockpiling of equipment and supplies; the development of arrangement for coordination, evacuation and public information; and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required.

Response: any concerted effort by two or more agencies, public or private, to provide assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected and in the restoration of essential public activities and facilities.

Recovery: is the effort to restore infrastructure and the social and economic life of a community to normal, but it should incorporate mitigation as a goal.

The disaster management cycle can be depicted in Figure 1 below.

Figure 1. Disaster Management and Disaster Preparedness

Source: https://www.researchgate.net/figure/Disaster-Management-Cycle_fig3_258343662

Sustainable Development Goals (SDGs): An inclusive agenda and universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. The SDGs work in the spirit of partnership and pragmatism to make the right choices now to improve life, in a sustainable way, for future generations. They provide clear guidelines and targets for all

countries to adopt in accordance with their own priorities and the environmental challenges of the world at large (UNDP)[3].

1.3   What is emergency preparedness?

Disasters strike in every corner of the world and often unexpected by their very nature, leaving little time, if any, to prepare. Nevertheless, to date, scientists have the ability to predict disasters with more accuracy. They know the areas prone to earthquakes and susceptible to wildfires and even can tell hours in advance whether a tsunami will hit the shores. However, inspite of all the capabilities for advance warnings, new challenges may be encountered everytime a disaster hits.

Hence, all places need emergency preparedness which involve a coordinated, co-operative process of preparing to match urgent needs with available resources. The essence of emergency preparedness is its capacity to tackle pressing needs with maximum efficiency and celerity but with scarce resources and in the absence of much necessary information.

Emergency preparedness can be defined as the arrangement to ensure that all resources and services required for coping with any imminent emergency or actual emergency are identified, determined, mobilised and deployed.[4] Meanwhile, FEMA (2015) states that preparedness is the state of being ready for action during a disaster or emergency, and based on this definition, the preparedness phase is achieved and maintained based on a continuous process of planning, training, organising, equipping, exercising, evaluating and taking corrective action.

In other words, preparedness is best thought of as a *process* – a continuing sequence of analyses, plan development, and the acquisition of individual and team performance skills achieved through training, drills, exercise, and critiques. It is a continuous and integrated process resulting from a wide range of risk reduction activities and resources rather than from a distinct sectoral activity by itself. This also infers that planning for emergency or being prepared for emergency is the development and maintenance of agreed procedures to prevent, reduce, control, mitigate and take other necessary actions in the event of an emergency.

The concept of preparedness planning is very important for those involved in disaster management. During an actual emergency, quick and effective action is required. This action often depends on having made and implemented preparedness plans. If appropriate action is not taken or if the response is delayed, lives may be needlessly lost.

Disaster preparedness planning involves identifying organizational resources, determining roles and responsibilities, developing policies and procedures and planning preparedness activities aimed at ensuring timely disaster preparation and effective emergency response. The aim of preparedness planning is to identify assignments and specific activities covering organizational and technical issues to ensure that response systems function successfully in the event of a disaster.

In a preliminary plan, even though the details of a disaster remain uncertain, disaster managers can identify emergency shelter sites, plan and publicize evacuation routes, identify emergency water sources, determine chains of command and communication procedures, train response personnel and educate people about what to do in case of an emergency. All of these measures

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[3] http://www.undp.org/content/undp/en/home/sustainable-development-goals.html

[4] Fagel (2011) in A Strategic Approach to Emergency Preparedness in the UAE. Hamdan Rashid Alteneiji. UK. 2015

will go a long way to improving the quality, timing and effectiveness of the response to a disaster. The actual planning process is preliminary in nature and is performed in a state of uncertainty until an actual emergency or disaster occurs.[5]

Therefore, emergency preparedness should provide a platform to design effective, realistic and coordinated planning, reduce duplication of efforts and increase the overall effectiveness of national societies, household and community members' emergency preparedness and response efforts. Emergency preparedness activities embedded with risk reduction measures can prevent disaster situations and also result in saving maximum lives and livelihoods during any disaster situation, enabling the affected population to get back to normalcy within a short time period. And, thus, the purpose of preparedness itself is to anticipate problems in disasters so that methods can be devised to address the problems effectively and so that the resources required for an effective response are in place beforehand.[6]

Besides, the steady growth of disaster risk, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in disaster preparedness and ensure that capacities are in place for effective response and recovery at all level. This awaken awareness that strengthening disaster preparedness is a top priority of disaster management programs at both national and local levels.[7]

Accordingly, strengthened preparedness is mainly concerned with two objectives: (1) increasing capacity to predict, monitor and be prepared to reduce damage or address potential threats and (2) strengthening preparedness to respond in an emergency and to assist those who have been adversely affected. Therefore, being prepared can reduce fear, anxiety, and lossess that accompany disasters. Moreover, people can also reduce impact of disasters and, sometimes, avoid the danger completely.[8]

Emergency preparedness and SDGs

Disaster and development are like two sides of a same coin that cannot be separated from one another. The formidable challenge of humanitarian relief and recovery following a disaster puts

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[5] Disaster Preparedness Training Programme International Federation of Red Cross and Red Crescent Societies. 2000

[6] Community Diagnosis for Sustainable Disaster Preparedness. Yoko Matsuda and Norio Okada. Journal of Natural Disaster Science Vol. 28 Number 1. 2006

[7] Priority 4: Enhancing disaster preparedness for effective response and to build back better in recovery, rehabilitation and reconstruction. Sendai Framework for Disaster Risk Reduction 2015 - 2030

[8] https://www.fema.gov/media-library-data/20130726-1549-20490-4325/why_prepare.pdf

incredible strain on limited public resources. In developing countries especially, it can force shifts in national development priorities, placing at risk fragile gains in areas such as poverty reduction, health and economic development. They undermine development achievements, impoverishing people and nations. Disasters, even, play a major role in pushing household below the poverty line and keeping them here. Evidence showed, for example, that the 2000 – 2001 drought in Sindh Province in Pakistan increased poverty up to 15 per cent and the Haiti earthquake pushed succesful poverty eradication efforts back 10 years. Figure 2 reveals some examples indicating that disasters can derail hard-earned development plans and progress

Figure 2. Estimated Percentage of People Falling into Poverty from Selected Disasters in the Asia-Pacific Region
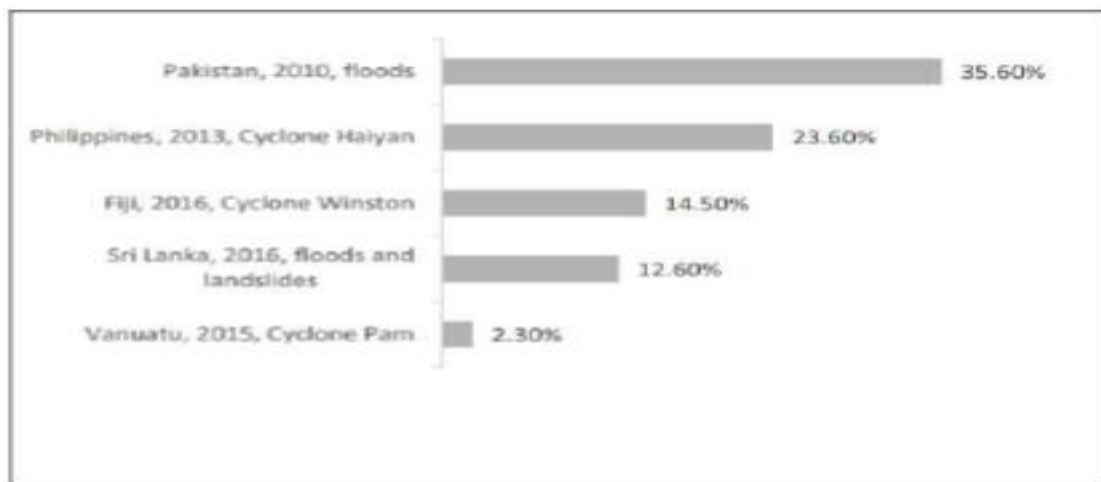
For a long time, the cause and effect relationship between disasters and development was ignored. Ministries of Planning and Finance and other development planners in a country may not concern themselves with disasters. At best, development planners hoped that disasters would not occur and, if they did, were most effectively handled by relief from donor countries and relief organizations. Development programs were not assesed in the context of disasters, neither from the effect of disaster on the development program nor from the point of whether the development program increased either the likelihood of a disaster on increased the potential damaging effects of a disaster. However, the growing body of knowledge on the relationships between disasters and development then indicates four basic themes as presented in Figure 3.

Figure 3. Development vs Vulnerability to Disasters

The side effect of well-meaning development efforts sometimes have disastrous consequences. Some types of development projects commence without fully assessing their impact on the environment. This can occur even in the programmes resulting from a disaster, such as a reconstruction projects that increase

demand for wood to fortify houses. The resulting deforestation can then bring increased vulnerability to mudslides and possibly long-term environmental changes.

On the other hand, it often takes the actual or imminet occurence of a large scale disaster to stimulate individual government to think about a developmental approach. Thus, a disaster can serve as a catalyst for introducing mitigation activities. Disasters often create a political and economic atmosphere wherein extensive changes can be made more rapidly than under normal circumstances. For example, in the aftermath of a disaster, there may be major opportunities to execute land reform programmes, to expand and modernize the economic base of the community, and so on.

Considering the above, without concerned efforts to address their root cause, disasters represent an increasingly serious obstacle to the achievement of SDGs. Thus, the Sendai Framework will have an important role in the implementation and achievement of the 2030 Agenda for Sustainable Development and vice versa. There is much to be gained from viewing the 2030 Agenda for Sustainable Development through the lens of disaster preparedness, disaster risk reduction and the Sendai Framework in particular. This is because disaster-related issues cut across different aspects and sectors of development. There are 25 targets related to disaster risk reduction in 10 of the 17 SDGs, firmly establishing the role of disaster risk reduction as a core development strategy.[9]

However, some goals deal most with disaster preparedness, like Goal 11 "Make cities and human settlements inclusive, safe, resilient and sustainable" (especially target 11.5) and Goal 13 "Take urgent action to combat climate change and its impacts" (particularly target 13.1 and 13.3).

1.4   Elements of emergency preparedness

Emergency preparedness is important since it deals with being able to avoid or plan to manage both natural and man-made disaster. It should take into account "all hazards", "all impact", "all phases", and "all stakeholders". Thus, elements of preparedness should also be maintained continuously during preparedness phase. This is vital to help to reduce the impacts of risk of disaster and its possible occurence which can cause harm and disruption to the plans and safety of people, the public, and the country.

The following session highlights the importance of elements of emergency preparedness – which consist of risk assessment, planning, training and exercise, organise and equip, early warning system and information system, and public education – independently and jointly, implemented as a continuous process and inevitable aspect of preparedness phase. Those elements are considered essential and should not be compromised on if response to any nature of emergency or disaster is to be effective in saving lives and minimizing costs and impacts.

Risk Assessment

Risk assessment can be defined as the process for determining the quality or quantity value of risk in relation to a situation or place and the recognized threat called hazard (Jakob, 2009).

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[9] Disaster Risk Reduction and Resilience in the 2030 Agenda for Sustainable Development: A reflection paper prepared by the UN Office for Disaster Risk Reduction, October 2015

Determining the quantity value of risk requires that components such as magnitude or potential loss are calculated or acknowledged in relation to the probability that the loss will eventually occur. This process usually determines the acceptable risk or the ones which can be tolerated.

The process for risk assessment involves that risk be identified, analysed, evaluated, treated and monitored. Risk in relation to disaster management is usually threat and scenario based, which affect places, time and process of managing disasters and the activities in society.

Risk assessment helps to identify and determine risk categories such as environmental, social, technical, economic and other categories that can pose a potential threat to the safety of the public. Risk assessment also plays a central role in influencing the types of actions taken for the other elements of emergency preparedness - risk assessment and ability to manage risks can determine the process of planning, the content of plans, how organise and equip is conducted, and other essential elements of emergency preparedness. Once potential, actual or foreseen risks are identified, the risk(s) can be mitigated, transferred, accepted or avoided completely. Table 1 provides example on how disaster-related risks are prevented, mitigated, transferred, and prepared.

Table 1. Disaster Risk Management

Activities	Definition	Example
Prevention	Activities and measures to avoid existing and new disaster risks	Relocating exposed people and assets away from a hazard area
Mitigation	The lessening or limitation of the adverse impacts of hazards and related disasters	Constructing flood defences, planting trees to stabilize slopes and implementing strict land use and building construction codes
Tranfer	The process of formally or informally shifting the consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party	insurance
Preparedness	The knowledge and capacities of governments, professional response and recover organizations, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent or current hazard events or conditions	Installing early warning systems, identifying evacuation routes and preparing emergency supplies

The impact of any identified disaster risk helps to determine the decision, mitigation and preparedness measures to put in place to ensure the safety of public. While risks are part of living, they still need to be managed, their impact reduced and mitigated. This can only be done through good, effective and adequate preparedness. Thus, government needs to understand the role of risk assessment in determining the appropriate level of emergency preparedness in order

to increase public trust, competence, efficiency and accountability. Figure 4 illustrates the relationship between risk assessment and how it influences other elements in preparedness phase.

Source: A Strategic Approach to Emergency Preparedness in the UAE, 2015

Risk management, therefore, should incorporate the social, ethical, scientific and factual implications of risks on the public and should be addressed within the decision making process. Therefore, "governance" should involve the implementation of strategies to mitigate risk and ensure appropriate preparedness for any disaster. In other words, while emergency preparedness involves strategies which are structural and non-structural, risk assessment can contribute significantly when there is adequate understanding of central role it plays in ensuring that emergency preparedness is effective.

Planning

Planning is the systematic, ongoing and informed process which helps to prepare organizations for response to emergencies. Planning involves the process of deciding, combining and taking actions, activities and documenting plans which serves as a guide for procedures, mobilising resources and carrying out response arrangement. This preparedness element ensures that organizations responsible for planning are engaged, informed and know their roles, and competent to carry out response activity assigned to them. Furthermore, planning is an essential systematic ongoing process which evolves as lessons are learned and circumstances about identified risks change. Hence, planning is viewed as part of cycle of activities which starts with establishing a risk profile that helps to determine the priorities for developing plans, review and revision of plans and then re-start the whole cycle again.

Emergency planning for disasters derives from civil defense, a form of social organization designed to protect civilians against aggression. Emergency planning is a relatively young field that began to develop systematically in the 1970s, coincidentally with the rise of civil protection. Initially, it did so largely in response to technlogical hazards such as toxic spills and industrial explosions. Later, it is evolving rapidly, driven by intensifying hazards, burgeoning vulnerabilities, and emerging risks. Hence, there is no established formula according to which a plan should be prepared.

To date, emergency preparedness planning can be defined as the process of preparing systematically for future contingencies, including major incidents and disasters. The plan is usually a document, shared between participants and stakeholders that specifies tasks and responsibilities

adopted in the multi-agency response to the emergency. It is a blueprint for managing events and, as such, should be responsive to management needs. It should specify the lineaments of action, collaboration, command, and communication during a disaster or major event; in other words, it is the framework for emergency response.

In this case, plans are needed, not only for responding to the impacts of disaster, but also to maintain continuity while managing the crisis, and to guide recovery and reconstruction effectively.[10] And, thus, emergency preparedness planning is often called contingency planning. At its most essential, emergency plan must match urgent needs to available resources, and do so in a timely way that avoids procrastination and delay. Contingency planning aims to prepare an organization to respond well to an emergency and its potential humanitarian impact. Developing a contingency plan involves making decisions in advance about the management of human and financial resources, coordination and communication procedures, and being aware of a range of technical and logistical response.[11]

The practice of emergency preparedness planning varies considerably among communities. In some, the planning process is quite formal; there is a specific assignment of responsibility to an office having an identifiable budget. In other communities, it is informal; responsibility is poorly defined and limited budget is dispersed among many agencies.

Moreover, the planning products might be either written or unwritten. To some extent, the emergency planning process correlates with the size of the community in which it takes place. Larger communities— characterized by an elaborate structure of governmental offices, many resources and personnel, and perhaps higher levels of staff turnover—tend to evolve formalized processes and rely more heavily upon written documentation and agreements. In smaller communities, the planning process might generate few written products and rely principally on informal relationships. Formalization of the planning process is also likely to vary with the frequency of hazard impact. In communities subject to frequent threats, emergency response may be a practiced skill rather than a hypothetical action. Figure 5 shows some planning models of emergency preparedness.

Figure 5. Emergency Preparedness Planning Models: Some Examples

1. United States Model

The US faces a wide range of threats, from hurricanes to impacts of acts of terrorism. This means that various approaches are used for particular threats and hazards, and various models and frameworks employed. As illustrated in the figure, the US model of preparedness is a closed, ongoing process made up of five stages, starting with planning, moving to organizing/equip, training, exercising and evaluation in order to continue the cycle again.

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[10] Disaster and Emergency Planning for Preparedness, Response and Recovery. David Alexander. Oxford Research Encyclopedia of Natural Hazard Science (online publication date: Sep 2015). DOI: 10.1093/acrefore/9780199389407.013.12

[11] Contingency planning guide. IFRC. Geneva. 2012

2. United Kingdom Model

In contrast to the US, the UK emergency planning cycles includes two main processes – embed and consult – which are expected to serve as guidelines for the preparedness phase. The former involves determining the actions and responsibilities of organizations required to manage the risk, after which all actions and responsibilities are agreed upon.

The UK cycle appears to be two independent cycles. One can only infer that each main process is coordinated by different organizations.
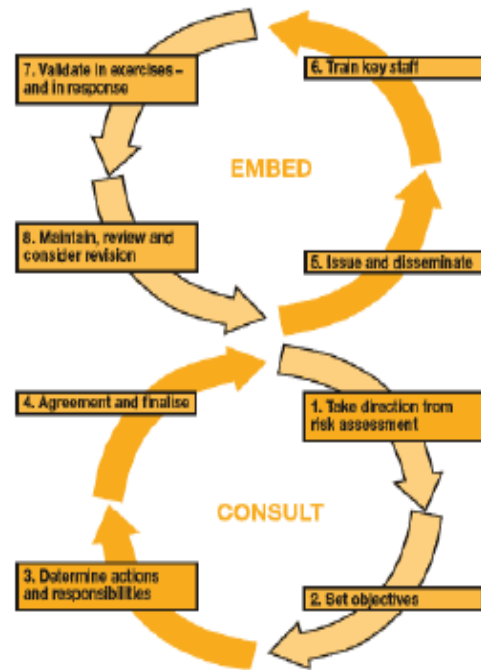
3. The Australia Model

The Australia emergency preparedness has been broken down into precise activities which can be readily implemented and understood by community and emergency managers which includes emergency response plan, warning system, evacuation plan, emergency communication, mutual aid agreement, public education, public information, resource inventories, training program, test exercise, and refuge shelters.

On the other hand, emergency preparedness planning might be conducted in the face of apathy by some and resistance from others. A basic reason is that most people, citizen and public officials are alike – they do not like to think about their vulnerability to disasters. Consequently, the initiation of planning activities requires strong support from a jurisdiction's Chief Administrative Officer, an *issue champion* (or *policy enterpreneur*) who has the expertise and organizational legitimacy to promote disaster management, or an emergency planning committee that can mobilize a constituency in support of disaster management. Besides, emergency planning should involve the allocation of power and resources (especially personnel and budget), so every unit within an organization wants its "proper role" recognized and a budget allocation commensurate with the role.

Formulating of emergency planning

The process of formulating an emergency plan is similar and parallel to urban and regional planning. Like urban and regional planners, emergency planners need to study the geography, demography, economics, social relations, and culture of the area that forms the jurisdiction of the plan. This is essential if the plan is to respond well to local hazards and vulnerabilities and be compatible with local perceptions, traditions, activities, and expectations.

Thus, plans for emergencies are expected to have specific requirements which makes them valid and capable of being used to respond to emergencies. Qualities of a good plan include, but are not limited to:

- Context, such as aim of plan and legislative framework being used

- Scenarios, such as risk, hazard and vulnerable areas to the impact of the emergency

- Emergency needs, e.g. medical care, public safety, search and rescue, food and shelter, evacuation, etc.

- Resources availability and utilisation, e.g. roles of responders, equipment, building, application of resources, testing, training and validation arrangement and schedule

- Activation procedures and stand-down procedures of the plan

- Location of control centre

- Annex with other essential information such as risk register, contact details of key personnel, etc.

In brief, emergency planning has three main components: an estimate of what is going to happen, a plan based on this estimate of what the response should be, and some action identified to be best prepared. However, an emphasis on too specific detail on the plan can be problematic in at least four ways: (1) the anticipation of all contingencies is simply impossible, (2) very specific details tend to get out of date very quickly, demanding virtually constant updating of written products; (3) very specific plans often contain so many details that the wide range of emergency functions appear to be of equal importance, causing response priorities to be unclear or confusing, and (4) the more detail incorporated into written planning documents, the larger and more complex they become. This makes it more difficult to use the plan as a device for training personnel to understand how their roles fit into the overall emergency response and consequently makes it more difficult to implement the plan effectively when the need arises.

On the other side, the plans need to exist in a nested hierarchy that extends from the local emergency response (the most fundamental level) through the regional tiers of government to national and even international levels. The "bedrock" level of emergency planning is the municipal level or local area. This is because, however extensive a disaster may be, the theater of operations for managing and responding to it is always local. However, if local resources are overwhelmed, it becomes necessary to move up the scale of response to inter-municipal, regional, national, or even international responses.

In other words, the emergency plan should either prescribe or describe the structure of command and management to be utilized in the case of a disaster. In a fully functional civil protection system, emergency resources hubs usually operate as a nested hierarchy. They will function within the compass of plans made at different levels of government and by different jurisdictions. It follows that the emergency plans themselves will need to ensure interoperability and a rational division of responsibilities, so that all tasks can be covered in emergencies of different sizes.

On the other hand, much has been made of the need for "all-hazards" contingency plans (probably with hazard-specific annexes). No place on earth is entirely free from hazard and risk. But, few of them are likely to be subject to only one kind of hazard. A good emergency plan should, therefore, make provision for managing all the known and anticipated hazards (the seasonal and recurrent events), while at the same time offering generic protocols to manage the unanticipated ones.

In this case, emergency planners should identify the types of hazards to which their communities are vulnerable. Following identification of these hazards, emergency planners should consider the

extent to which different hazard agents make similar demands on the emergency response organization. When two hazard agents have similar characteristics, they are likely to require the same emergency response functions. Commonality of emergency response functions provides multiple use opportunities for personnel, procedures, facilities, and equipment. Only when hazard agents have very different characteristics, and thus require distinctly different responses, will hazard-specific appendixes be needed.

One issue that has long perturbed is the size of event for which plans should be configured. If one assumes that recurrent hazards are in a steady state, then somewhere there should be a "happy medium", in which an extreme event is neither too large and infrequent to be expected to occur during the life of the plan, nor too small and frequent to need significant emergency provisions. The first problem with this arrangement is that, especially regarding natural hazards, there are few cases in which an adequate magnitude-frequency relationship has been established. Hence, the likelihood of an extreme event of a given size may be conjectural, rather than scientifically determined. The second problem is that the time series of events may be non-stationary. For example, there is overwhelming scientific consensus on the occurence of climate change, and few scientists now doubt the speed at which it is occuring.

Humanitarian reform and the cluster system

Since 2005, there have been significant changes to the way the international humanitarian system of response has been organized, i.e. the introduction of 'cluster system'. This assigns coordination and leadership responsibilities to a number of operational humanitarian agencies globally for some key sectors as seen in Figure 6. Clusters are group of humanitarian organizations, in each of the main sectors of humanitarian action. A cluster approach may be used in conflict-related humanitarian emergencies and disaster situations and may vary from one nation to another. The cluster approach aims to strengthen system-wide preparedness, make sure that critical materials and expertise are immediately available, and focus technical capacity. The core functions of a cluster at country level are[12]:

- support service delivery by providing a platform for agreeing approaches and eliminating duplication

- inform strategic decision-making of the Humanitarian Coordinators (HC) or Humanitarian Country Team (HCT) by coordinating needs assessment, gap analysis, and prioritization

- plan and develop strategy, including cluster plans, adherence to standards and funding needs

- advocate to address concerns on behalf of cluster participants and affected populations

- monitor and report on the cluster strategy and its result, and recommend corrective action when necessary

- undertake contingency planning, preparedness, or capacity building where capacity exists in the cluster.

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[12] Emergency Handbook at https://emergency.unhcr.org/entry/61190/cluster-approach-iasc

Each cluster is also responsible for mainstreaming protection and integrating early recovery from the outset of the humanitarian response.

Source: Emergency Handbook, https://emergency.unhcr.org/entry/61190/cluster-approach-iasc

Scenario and assumption in emergency planning

In the absence of an actual disaster, emergency planning against them should be based on scenarios. These will enable urgent needs to be foreseen and situations to be anticipated by providing the right resources in the right place and at the right time. Hence, scenarios should be a vital ingredient of emergency plans. A scenario is a postulated sequence or development of events. Scenarios can be used to reconstruct past disasters, where the evolution of these is incompletely known. For the purpose of emergency planning, the more accurate the scenario, the better prepared the organization is likely to be.

Box 2. Preparedness Scenario based on Previous Hazard: Case Study of Japan's Tsunami
The magnitude 9 earthquake that occured off the east cost of Japan in 2011 caused a tsunami that was considerably higher than those most parts of the coast had prepared for. People were washed off refuge monds and the Fukushima Da'ichi nuclear plant was overrun with water, leading to meltdown.
The plant actually was protected against a tsunami that would result from an offshore earthquake with magnitude up to 7.5

Typically, an emergency planning scenario will be based on a "reference event", or possibly more than one event. This will be a disaster that in the past affected the area covered by the plan, and which it is deemed may be repeated in the future. Efforts must be made to assemble a plausible set of hazard data that represent the range of possibilities for the physical impact, for example, the wind speed, precipitation, or the magnitude and epicentral location of an earthquake.

Therefore, it is often said that "we plan for the last event, not the next one." There is indeed a tendency to base assumptions about the size

and characteristics of each event that will be faced in the future on the historical record of such events in the past, particularly the recent past. Moreover, the nature of built environment, the economy, the demography, and social characteristicss of the area and the assets at risk will all have changed since the reference event. So what if the next event is entirely out of character?

Consequently, modern conditions must also be added to the scenario. This then needs to be developed as a temporal sequences of evolution in terms of hazard occurence, the impact on vulnerable people and assets, and the response of emergency services. Because aggregate patterns of human behaviour also change, several runs of the scenario may be needed. For example, an earthquake scenario may use the last seismic disaster as its reference, but the future projection may need to be made for an earthquake that occurs during the night, on a working day, or on a holiday as there will be different effects on people and buildings and structures that they use.

In a simple way, the inputs of a scenario are the reference event and accompanying conditions (social, environmental, economic, etc); the output is the outcome of disaster and its management; the throughputs and transformations are the evolution of the scenario over time. Moreover, the plan itself contains of assumptions about what is needed during the event of disaster and is commonly developed for specific sectors and scenarios. In this case, those assumptions need to be considered within the compass of what is feasible with the available human and technical resources. The point of using scenarios in emergency planning is to be able to explore and anticipate needs generated by predictable future disasters. Hence, the scenario should produce a range of possible outcomes and should be used as an exploratory tool.

Box 3. Important Elements for Developing a Scenario
Some of the important elements for developing a scenario are: (a) numbers of people affected, (b) priority humanitarian needs - this usually changes with time, (c) demographic, vulnerability, (d) geography, access, logistical considerations, (e) scale of the response (community, government, aid agencies), and (f) functioning of markets, socio-political dimensions, resources.
Source: Contingency Planning Guide. IFRC

Emergency plan, thereof, should also take into account both the limitations and the capabilities of response which is determined by the availability of trained personnel, expertise, equipment, supplies, communications, vehicles and buildings. Besides, emergency planning has to be realistic. This means that it can only be applied to resources that actually exist or can be obtained within an approximately brief time frame. The plan should be able to ensure that every participant in the response to an emergency has a role, and that all anticipated tasks are covered such that the risk of hiatuses or disputes about responsibilities is minimised.

Furthermore, emergency preparedness plan must be based on accurate assumptions about the aid from external sources. In major disasters, hospital might be overloaded; destruction of telecommunication and transportation systems (highways, railroads, airports, and seaports) could prevent outside assistance from arriving for days; and restoration of disrupted water, electric power, and natural gas pipeline systems could take much longer. Consequently, all social units must be prepared to be self reliant for as much as a week before external assistance comes.

However, problems may come when plans are often made for people and emergency agencies without consultation or involving them in the process. This lack of consultation or involvement often makes response to emergencies difficult and problematic. For example, emergency plans include

specifying the roles, resources and equipment necessary for response to emergency. In order to document an effective plan, it is important to confirm if the responding agencies that will help with response to the emergency have the capacity to respond and provide such expertise before stating that they will do it.

Activation of the plan

The impact phase of a disaster is usually a period, more or less brief, characterized by dynamic evolution and acute shortage of information. One of the first need is for an assessment that determine whether to move into emergency mode. The declaration of a state of emergency allows the formal abandonment of normal working procedures and the immediate adoption of those that pertain strictly to disaster. Table 2 provides functional differences needed within different size of event.

Table 2. Functional Differences between Different Sizes of Event

	Incidents	Major Incidents	Disasters	Catastrophes
Size of impact	Very localized	Fully or partially localized	Widespread and severe	Extremely large in the physical and social sphere
Size of response	Local resources used	Mainly local resources used, with some mutual assistance from nearby areas	Intergovernmental, multi-agency, multi-jurisdictional response needed	Major national and international resources and coordination are required
Plans and procedures activated	Standard operating procedures used	Standard operating procedures used; emergency plans may be activated	Disaster or emergency plan activated	Disaster or emergency plan activated, but huge challenge may overwhelm them
Impact on response resources needed for response	Local resources will probably be sufficient	Local resources and some outside resources needed	Extensive damage to resources in disaster area, major international transfers of resources needed	Local and regional emergency response systems paralyzed and in need much of outside help
Involvement of public in response	Public generally not involved in response	Public largely not involved in response	Public extensively involved in response	Public overwhelmingly involved in response

Note: adapted from Tierney, K. Hurricane Katrina: Catasthropic impacts and alarming lessons

Almost as essential as knowing what you are going to do in a response, is to know when you are going to do it. Therefore, every plan should have a small section outlining how the plan is to be activated, when, and by whom.

Subsequently, the emergency phase may continue for hours or days, and in exceptional cases for weeks. However, it should end with a formal declaration of "stand-down", as prescribed in the plan, which releases personnel for leave and ordinary duties.

Policies and governmental responses on emergency preparedness

Emergency preparedness plan should clearly define the "institutional architecture" necessary to implement it. Some available protocols related to disaster preparedness are:

- The Sendai Framework for Disaster Risk Reduction

   The Sendai framework emphasized the roles of stakeholders in implementing some actions and the need for cooperation and clarity of roles in implementing the priorities. All four priorities are also closely connected to reducing related risk factors and reinforcing disaster preparedness measures in order to respond effectively at all levels. Besides, it provides guidelines for international institutions and countries to use in reducing risks to disaster and for preparing to respond to disasters when they occur. The frameworks also serve as guidelines for international institutions to use whenever international interventions are required in a country.

- The Paris Agreement

   The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gas emissions mitigation, adaptation and finance starting in the year 2020. Under this agreement, each country must determine, plan, and regularly report on the contribution that it undertakes to mitigate global warming.

- Legal and regulatory framework of disaster preparedness at national level

   Disaster law or legal framework is critical in helping to create the right legislative environment within which disaster preparedness strategies and activities can become effective. It is important because it is the main expression of a country's commitment to address the needs of the most at-risk communities through institutionalized, sustained and properly resourced mechanisms. It establishes legal authority for programs and organizations that relate to hazards, risk and risk management. Therefore, a sound legislation should outline a monitoring and enforcement regime that requires entities responsible for building a preparedness capability to report back on their work, and set targets for accountability within the system.

   The legal and regularity framework serves as a basis for good governance and accountability. Although disasters occur locally and often require locally specific action, their transboundary nature calls for collaborative action between neighboring states, and thus, it is important to make sure that national legislation is compatible regionally.

   It is also important that the institutional arrangements necessary for preparedness are also reflected in local/state and national legislation. This law (or laws) will guide which activities can be implemented under what conditions and establish who has overall responsibility in disaster. It also defines a coordination structure, articulating both horizontal (between different sectors) and vertical (between national, sub-national and local entities and authorities) linkage. In other words, it specifies the role of key ministries/agencies, national and international organizations and civil society actors in preparedness and response to avoid confusion in the early days of a response.

- National disaster plans

  These plans outline disaster management strategies and provide the basis for setting priorities for and coordinating disaster management – which includes emergency preparedness - activities at all levels, following an analysis of potential risks. In some countries, the national disaster plan takes the form of a general framework for disaster management and is complemented by more detail sub-plans, known as implementation plans, specific plans, operational or emergency plans. In other countries, national disaster plans themselves contain operational details.

- Disaster risk assessment document

  Disaster risk assessment should guide the optimal allocation of resources to the phases of disaster management. By identifying and assessing the likelihood and consequences of potentially disastrous events, risk assessment provides governments with the basis for the prioritisation of investment in preparing for disasters.[13]

Table 3 shows some of the main international agreements and commitment that include provisions on preparedness.

Table 3. International Agreement and Commitment on Preparedness	
Sustainable Development Goals (SDGs)	SDG 1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable. SDG 1.5: By 2030, build the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.
Sendai Framework for Disaster Risk Reduction 2015 - 2030	Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.
Agenda for Humanity	Change people's lives: from delivering aid to ending need. Core responsibility four-B: Anticipate, do not wait for crises (para 118 – 122)
Good Humanitarian Donorship	Principle 1: The objectives of humanitarian aid are to save lives, alleviate suffering and maintain human dignity during and in the aftermath of man-made crises and natural disasters, as well as to prevent and stengthen preparedness for the occurence of such situations.

Exercise and Training

Emergency planning document should include a statement about the nature of training and exercising, how they are provided and their frequency. Within this context, exercise can be defined as a simulation to validate an emergency plan to rehearse key staff and/or test systems and procedures for emergency response. The role of exercise is to ensure that emergency plans and planning process are effective, while training is provided for the appropriate number of

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[13] http://www.oecd.org/finance/insurance/G20disasterriskmanagement.pdf

personnel who are responsible for responding to emergencies when they occur. Exercise must be simple but facilitated based on analysis of an actual emergency situation and carried out in a serious and professional manner. Thus the exercise will help to examine existing operational plans, structures and procedures, while also helping to identify areas that require refinement and review in the plan.

Photo: Table Top Exercise (http://www.siwalimanews.com/post/18_negara_hadiri_ttx_ambon_direx_2016)

Exercices can be divided into table-top, live, drill, and discussion-based. Some of these types, such as live and drill, can be large scale involving all emergency operations and members of public to test emergency procedures. The exercise type used to test and validate a plan is determined based on scenario, procedures, capability, communication and protocol that require testing. Although exercise can be demanding and stressful, requiring detailed coordination, planning and time to organise and carry out, when done effectively it helps to enhance skills.

Meanwhile, training is defined as the required knowledge, skills and abilities provided to emergency responders, emergency officials, and other personnel to perform key tasks required for specific emergency preparedness capabilities which will be used for response to emergencies or disasters. Training is also provided for other people whom responders consider strategic to the emergency response and whose roles are stated in the plan to support response to emergencies.

Exercises helps to identify areas where existing capabilities to manage emergencies are insufficient and where additional resources and training are required for the level of capability desired. Training is distinct from exercise because training is about increasing the skills, capability and competence of response personnel named in the plan and who will mobilised for emergency.

Exercising and training elements are important aspects of emergency preparedness because plans need to be validated for them to be effective. They need to be designed with clear, well formulated objectives, and their progress needs to be carefully monitored so that any need for improvement can be detected and communicated to participants in post-exercise and training debriefings and reports.

To follow them up, emergency planning process must detect and respond to these changes. Unfortunately, this point is frequently not recognized. In fact, there is nothing worse that the "paper plan syndrome" in which the plan is formulated and relegated to a desk drawer without being used or updated. Such plans can do more harm than good when they are eventually put to the test by a crisis. As time wears on, both small and large changes will occur. Hence the plan should

include provisions, not only for disseminating it and training its users, but also for a process of constant updating, with checks at regular intervals.

Organise and Equip

Emergency assistance can be difficult to implement with limited materials, resources, equipment and time. This makes organise and equip equally important elements of emergency preparedness. Organise and equip involve identifying and organising a reliable database of key relevant resources and an operations system capable of handling emergency communications, facilitation and procedures. Organise and equip are also crucial because they help to ensure that communication between and among emergency organizations and with the public are well understood and communicated.

Equip, which needs to be done at preparedness phase, involves ensuring good service, supplies and facilities which can facilitate effective emergency response. Equip as an element of preparedness helps to determine the point of rendezvous as well as the vocal point of correspondence from where response arrangements will be coordinated, monitored, evaluated and mobilized, and this needs to be organized as stated in the emergency procedures in the plan.

Organise and equip are key to effective and efficient organising of facilities, resources and services required for responding to emergencies and ensuring the safety of the public. Furthermore, good equipping and organising is required in order to develop and implement comprehensive public awareness, public education programs and information systems and modality. According to Phillips (2005), the importance of being well organised and equipped during the planning phase of an emergency can encourage the participation and involvement of the public in emergency management systems.

Early Warning System and Information System

There are two main aspects of communication in emergency preparedness that involve public awareness about risks of emergencies. The first aspect involves informing the public about how the emergency sector plans to deal with the risks of emergencies when they occur. The second aspect is early warning, to warn the public and provide them with information and advice necessary for the onset of emergency.

In addition, the emergency notification aligns with the early warning to alert emergency managers, responders and the public. While it has been observed that emergency situations have the tendency to disrupt communications put in place, it is important that early warning comprises detailed information, such that it can still facilitate the required communication for ensuring the safety of the public. According to Civil Contingency Act (2004) responders require regular updates and information about emergency situations so they can take decisions that will help to deal appropriately with emergency situations. Updated information is also required for activation and stand-down procedures before and after emergency occurs and this is done through equipped information systems.

Whether natural or antropogenic, hazards vary considerably in their predictability and the amount of lead time, if any, for preparations to take place. To deal with it, emergency managers should devise procedures for warning the risk area for each of the different hazards identified in the community. In slow onset incidents, such as main stem flood, there is likely to be adequate time for mechanisms such as face-to-face warnings. However, rapid onset incidents, such as toxic chemical release, might require the acquisition of siren system. Therefore, short-term warning must be distinguished from the longer-term predictability of hazards.

Photo: Cyclone Alert in Bangladesh

Warnings have three essential components: scientific and technical, administrative, and social (as shown in Figure 7). The absence or ineffectiveness of any of them renders the warning system inoperable. Scientific information on an impending hazard must be transformed into a message to be acted upon, and a decision must be taken to warn affected people who must then hear and react appropriately to the warning. The emergency plan should determine how to transform information on hazards to advice or orders on how to react. It should prescribe the means of disseminating the message and monitoring the social reaction to it. In practical terms, evacuation or sheltering is usually the most appropriate reaction to warning and the best way of moving people out of harm's way.

Figure 7. The Components of Warning Process

To facilitate this process, many use computer databases to provide information to responders. Siren systems, emergency management software, notification systems, network-centric emergency

notification, mass text messaging services, mass automated dialing services, reverse emergency calls, etc, are some of the commonly used information system gadgets.

Communication and information systems can be stretched and overloaded during major emergencies due to power failure, congestion and collapse of system. There is a need, therefore, to develop systematic approaches or procedures for ensuring that responders, emergency managers and the public all understand the warning system and know what each information system is used for. Furthermore, there are several limitations with information systems and warning systems depending on the emergency or location. For example, if the emergency is an explosion, it can render a public address system useless, while using a siren alarm in a deaf school would also be useless.

Therefore, by examining early warning systems and information systems, it is evident that there are several types of early warning systems based on risk assessment elements identified and areas that will be affected by emergency. Information systems also depend on the types of emergency response organizations who will be involved in the emergency that might be determined by the risk assessment. Both early warning system and information system also influence the equip element of preparedness by helping to determine the information sharing platform jointly decided by emergency response organizations and other public stakeholders. This is because the wrong type of information sharing or early warning system, decided without the consultation of all stakeholders, may cause confusion and inability to respond when emergency occurs. The limitations of early warning systems and information systems, such as network breakdown and problems with connectivity during severe weather, emphasize the importance of the next element, which is public education.

Public Education

Photo: Publication by FEMA (https://www.fema.gov/media-library-data/1389294951288-b25113d9aef2b877323d380720827f3b/R3_trifold_eng.pdf)

Public education can be defined as the process which involves informing and educating the public about risks and preparedness activities which the emergency organizations have put in place to support them. Pre-disaster public education (or public awareness) involves information to help the public understand risks they may face and the basic steps they can take to avoid these risks. Also the emergency sector provides information about contact details and how they can be further trained or educated in procedures that can ensure their safety and that of their family or organization.

Type or medium of public education depends on the composition of the public. For example, public education can be undertaken through campaigns, door to door awareness, publishing pamphlets

containing of information, media announcements, and multimedia message on billboards, direct radio broadcasts, and public adress announcements in public buildings. While it is important to make public education for emergency preparedness as simple as possible, it is also important that the medium selected does not provide misleading or errneous information.

1.5   Key components in emergency preparedness planning

Our capacity to respond to a disaster depends on the ability of numerous response systems to work together. Moreover, disaster preparedness is not a simple concept. It is not only about stockpiles of equipment and supplies. It is about what people know, what they think, and who they trust. It is not only about individual preparedness, but more about community preparedness.

Evacuation and Shelter

Emergency plans should include planning to address a myriad of threats and indicate when evacuation and shelter is appropriate. Therefore, jurisdictions should consider existing concepts, plans, systems, resources, and practices. Lessons learned from previous disasters have proven that evacuation and shelter protective actions vary based on the threat or hazard. They can also vary based on a community's demographics, infrastructure, resources, authorities and decision making process.

One important matter in preparedness planning is the extent to which transitional shelter should be provided. Meeting shelter needs after disasters should be seen as a process of "sheltering" done by affected households with different materials, technical, financial, and social assistance.

Meanwhile, evacuation refers to the arrangements established in advance to enable the moving of people and assets temporarily to safer places before, during or after the occurrence of hazardous event in order to protect them. Evacuation may include interagency responses and should be integrated with region or operational area plans. When conducting evacuation, emergency preparedness committee should consider alternative locations, communications, transport option, separation of evacuation routes for pick up and delivery of victims, cache of supplies or resources, and employee and victims safety. Evacuation also requires a command structure to best manage the situation.

Figure 8 . The Chaos of Evacuation and Refugee Shelter during Disaster

Photo: https://news.detik.com   Photo: https://www.antaranews.com

A shared understanding of evacuation and shelter planning is essential to effective emergency planning. In this case, evacuation and shelter planning should be consistent with existing jurisdictional authorities, roles, and responsibility, as defined in the current statutes, regulations, delegations of power, MoUs, policies, and other guidance documents. In some jurisdictions, the authorities to issue an evacuation order or shelter are probably not clearly defined or lie with a vacant office. These situations will require a specific guidance on further authority and coordination between levels of government to clarify processes before an event occurs.

Box 4. Evacuation Chaos: Studi from Mount Merapi Eruption, Indonesia

The number of affected communities continued to increase after Government of Indonesia (GoI) announced the Merapi eruption hazard zone to be expanded to 20km. It caused panic among people since the days before GoI had warned that only those who lived within 10km should evacuate. The latest announcement had made the number of refugees 10 times swollen than predicted.

And the chaos was just to start. The disaster management officers went back and forth using large vehicles to be able to simultaneouosuly evacuate many victims once they arrived in hazard zones. On the other side, there were also self evacuation and volunteers coming to hazard zones to help the victims. All these created a very bad traffic jam.

Existing evacuation routes were not sufficient to accomodate the flow of the refugees. The vehicles could not even move at all. And thus, people started to leave their cars because they were worrying about being exposed to the hot clouds. Conditions were getting worse causing officers, military personnels and refugees had to walk to evacuate themselves to the safer places.

An evacuation should move as few people as possible the shortest distance possible while providing their safety. Besides, evacuation orders should target specific populations within zones at risks. When conducting an evacuation, evacuee tracking can become a part of evacuation operations based on jurisdictional capabilities and resource needs. Additionally, jurisdictions should ensure citizens that the systems will protect personally identifiable information while facilitating reunification and ensuring safety during an evacuation. Besides, jurisdictions should also coordinate mass care efforts concurrently with evacuation/sheltering planning so that populations evacuating from a disaster area have a safe location to seek refugee. Evacuation plan should also account for critical transportation needs (CTN) population which encompasses any evacuees with limited or no access to transportation who require assistance to evacuate safely.

In addition, evacuation and shelter zones allows jurisdictions to target zone-based evacuation to the most vulnerale areas, while also limiting the need for evacuating large areas that are not under the theat of a hazard. Zones need to be easily recognizable by both first responders and citizens to ensure clear messaging on protective actions occuring because of the hazard. However, the mechanism for assigning these zones will vary from jurisdiction to jurisdiction.

Being prepared for an evacuation includes identifying primary evacuation routes from multiple locations as well as to make informed decisions on the appropriate transportation models. Meanwhile, preparation for shelter includes ensuring that the family or individual has a specified shelter location. This shelter should provide a secure facility, a cot to sleep on, enough non-perishable food, blankets, communication equipment, alternate power sources, first aid supplies, necessary medications, durable medical equipment, and any functional assistance.

Moreover, when doing a self evacuation, basic supplies should be stored so they can be grabbed quickly when needed to evacuate. When making list, people may consider Five Ps of Evacuation as reflected in Figure 9.[14]

Figure 9. Five Ps of Self Evacuation
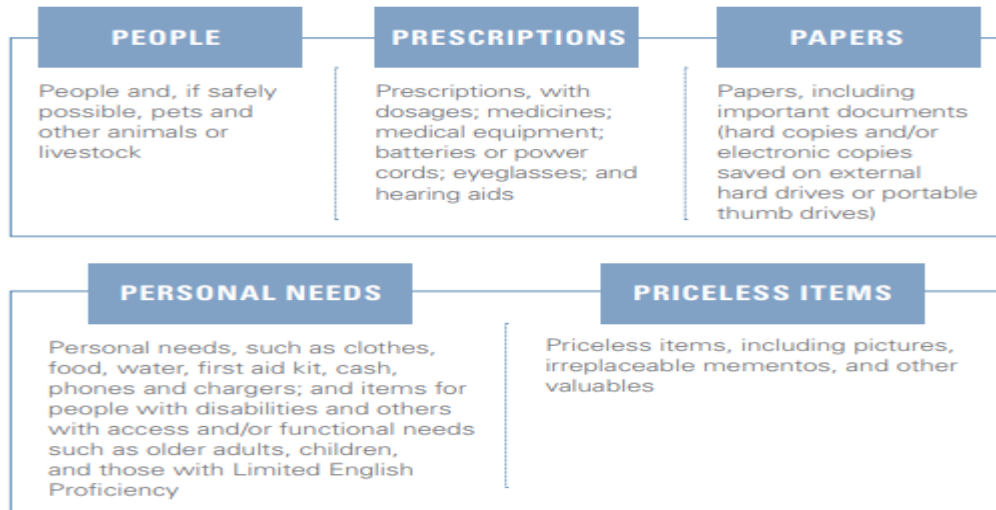
Nevertheless, problems may come up in evacuation and sheltering. The longer people have been living in an area, the less likely they are to evacuate since usually they have been accustomed of the hazards that kept on happening in their areas, lost faith in officials ability to predict a threat, and fear that their homes and business will be looted. Additionally, those who evacuated had experienced frustration due to lack of system facilities within the area, such as not enough comfort room, space for resting, privacy and sanitation, and thus deters future evacuation.

Since lives are at stake, the government should ensure that some critical considerations are weighed during evacuation and shelter planning, such as accessibility, contraflow lane reversal, correctional facilities, possibility of domestic/sexual violence shelters, fuel management, individuals with access and functional needs, and mass care services.

Logistics and stockpiling

The humanitarian supply chain is a complicated, dynamic and powerful mechanism. Involving up to 80 per cent of humanitarian organizations' operational budgets, logistics are often the most complex element of an emergency relief operation.

Logistics means different thing to different groups. The common definition of logistics is the process of planning, implementing and controlling the efficient, cost-effective flow of and storage of goods and materials as well as related information, from point of origin to point of consumption for the purpose of meeting the end beneficiary's requirement.[15]

Due to its expertise in the field of humanitarian logistics, the World Food Program (WFP) was chosen by the UN to be the lead agency for the Logistics Cluster. Logistics cluster is a mechanism

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[14] https://www.fema.gov/media-library-data/1409002852888-3c5d1f64f12df02aa801901cc7c311ca/how_to_prepare_flood_033014_508.pdf downloaded on July, 25th, 2018

[15] Study on International Humanitarian Transport, Logistics and Stockpiling Capacities for the European Comission Directorate General for Humanitarian Aid. 2009

responsible for coordination, information management, and – when necessary – logistics services provision to ensure that the effective and efficient logistic response takes place in humanitarian emergency missions. Dealing with disaster, the logistics cluster project aims to create a common, sustainable approach to supply chain preparedness. The core idea of supply chain preparedness efforts is to support local and international actors, before an emergency, to identify and address systemic challenges in local supply chain systems, in a sustainable way.

The logistics cluster also works to develop and improve the capacity, efficiency, and effectiveness of the logistics response in the future emergencies. Preparedness training, activities, and tools are also available to benefit the entire humanitarian community through the logistics cluster, and represent the combined expertise of the humanitarian logistics sector.

> **Box 5. Role of WFP in Logistics Cluster: a Study from Bangladesh**
>
> Since 1992, Cox's Bazar continues to experience an intermittent influx of refugee from Myanmar. A new influx of undocumented Myanmar Nationals, estimated at 655,500 as of 31 December 2017, has eroded already compromised resources in the existing make shift settlements and refugee camps at Kutupalong and Balukhali. WFP, together with the Ministry of Disaster Management and Relief (MoDMR), is co-chairing the logistic sector in Bangladesh, and as lead agency of the logistics cluster, is coordinating the logistics sectors in Cox's Bazar.
>
> The main logistics constraints faced by humanitarian organizations responding to the emergency are the lack of available storage facilities and clear custom procedures, as well as the inability to prepare for the potential damages and impairments which the upcoming cyclone season may cause.
>
> The logistics sector has set up logistics hub in the space allocated by the government; 15 mobile storage units for a total of 2,184m2 have been made available for all humanitarian organizations as well as for the government, on a free to user basis.
>
> The logistics sector has also been coordinating with the different governmental actors involved in the response, including the military, and managing and sharing information on custom procedures, access constraints and other key operational data.
>
> It has also been gathering and compiling information on market assessment, price monitoring and local procurement to feed into the Bangladesh Logistics Capacity Assessment (LCA).
>
> Source: https://logcluster.org/annualreport/2017/

Moreover, supply chains are essential to humanitarian operations and emergency responses. Emergency planning for them has two aspects. The first is an element of business continuity. It seeks alternative ways to ensure supplies of goods and services in order to keep productivity from falling as a result of interruption of normal business. This requires planners to determine which assets are critical and where the destruction or failure of assets may have a critical effect on the whole production cycle. The second involves ensuring efficiency in humanitarian supply, such as the forces on the ground are not left bereft of the equipment, goods, and manpower that are needed to tackle the emergency effectively.

Proper location of emergency resources within the supply chain in anticipation of a disaster can provide tremendous paybacks during times of crisis. In other words, part of being ready for a disaster is being in the right place to start with. Besides, emergency resources need to be located in places that are not vulnerable to attack. Yet, they need to be close to the areas to which they are assigned to serve so they provides logistics managers with quick access to critical resources while minimizing the total cost spent. Box 6 provides tips for relevant parties to deal with supply chain security.

System preparedness

Modern emergency responses are heavily reliant on information and communications technology. Emergency plans should reflect these innovations and the opportunities they bring for sharing information and developing a sypnotic picture of a rapidly evolving situation on the ground.

To respond during emergencies or disasters, public agencies need to have core system capacities in place. Those systems might achieve these capacities by either establishing those services themselves or through agreements with outside partners which may include among others:

- preparedness and response capabilities which refer to the capacity of agencies to prepare for and respond to disasters and emergencies

- communication services which refer to the capacity to disseminate accurate and timely information to the public before and during an emergency

- information systems which refere to the structure and organization of information exchange and flows for rapid communication, analysis, and intepretation of disaster-related data and the public's access to the data. The interface among agencies and departments located in different jurisdictions and at different administrative levels is critical

- surveillance refers to the capacity to track and forecast events, including the detection of any changes in the disaster patterns

- policy and evaluation activities include the work of public agencies to develop disaster-related policies and laws.

A further issue is the need for emergency planning in different system. The United Kingdom's Civil Contingencies Act of 2004, for example, obliges the providers of fundamental services to draw up system emergency plans. Industrial firms, for example, need plans, so that they can cope with technological failures and their consequences. Besides, emergency plans are needed in both hospitals and the health systems of which they form a part. Hospital plans should state the preparations needed for internal and external emergencies. In addition, public transport services need emergency plans to guarantee the movement of people and goods during a crisis and its aftermath.

Educational institutions should also take into consideration the importance of providing a safe education to pupils and students. Today, there is a requirement to ensure that school students are looked after in safety throughout an emergency since schools and other institutions have been target of natural hazards, terrorism (such as marauding gunmen) and structural collapse and fire.

Finally, there is an increasing realization that emergency plans are needed to protect cultural heritage, which includes a huge variety of sites and artefacts, many of which have highly specialized conservation requirements. Loss of cultural heritage in disasters such as floods and earthquakes can deal a catastrophic blow to the intellectual and artistic life of a country by obliterating or damaging an irreplaceable legacy.

Community-based preparedness

> **Box 7. Bosai Girl: Get Japanese Youth Prepared for Emergencies**
>
> Triggered by 2011 earthquake and tsunami disaster that hit the Tohoku region, Bosai Girl (translated into Disaster Preparedness Girl) tries to break down the conservative concept of disaster preparedness. It builds collaboration project with some companies and communities to create new products for disaster preparedness, for example folded shoes, bags covered with 3D hazard maps, and healthy food.
>
> The group also organised evacuation drills in areas popular with the youth. They use a smartphone application to find their way to evacuation centers and support stations as quickly as possible

Recent disasters have revealed limitations in the timing and mobility of government assistance to the public. Being the first to suffer, the affected community usually becomes the first responder in any disaster situation. Local populations in disaster-striken areas are the first to respond to a disaster. They are usually involved in search and rescue activities as well as in providing emergency treatment and relief to their families, friends and neighbors.

Involving communities in disaster preparedness activities is crucial since communities in high risk areas have often developed their own coping mechanisms and strategies to reduce the impact of disasters. It is important to appreciate this local knowledge and resources, and to build on them in order to improve the capacity of people to withstand the impact of disasters. Furthermore, another reason to invest in community-based disaster preparedness is because it is not only "big disasters" that destroy life and livelihoods. Accumulated losses from small floods, droughts and landslides can probably exceed the losses from big disasters and contribute significantly to increased vulnerability at the local level. These disasters attract little media attention and communities are often left on their own to cope with the destruction.

Therefore, preparedness plans for communities that are based on the mutual assistances within the community have been highlighted as areas for improvement.[16] Community level involvement and interventions are crucial to the success of any disaster risk reduction and preparedness efforts. In this situation, a central role for local communities as active participants should be acknowledged and promoted. The government, in partnership with other community organization and networks, can play an important role in improving the skills and knowledge of these "spontaneous" disaster responders by providing them with education and training in preparedness measures, basic rescue techniques, and first aid and emergency treatment. Therefore, community-based disaster

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[16] http://www.bousai.go.jp/keikaku/20111227_basic_plan.pdf

preparedness is a process that seeks to develop and implement a locally appropriate and locally "owned" strategy for disaster preparedness and risk reduction.[17]

Endangered communities must be able to learn about their risks and options and work together flexibly and creatively to solve problems. Therefore, when emergency responses of local and national governments often cannot reach affected populations immediately after an event, especially when a disaster strikes a large area at the same time, the preparedness of community has been proven to be a cornerstone of support to the affected victims. The UN even gives more attention to public participation in disaster. United Nations Public Sector Award (UNPSA) 2019 has awarded PetaBencana.id, an open source and participatory platform initiated by Indonesian National Disaster Management Agency. This platform enables crowdsourcing and public reporting for disaster in Indonesia, and thus those disasters can be managed properly as soon as possible.

Box 8. Community Preparedness in Indonesia: Living in Harmony with Active Volcanoes through Sister Village Program

Four million people live around volcanoes in Indonesia. Mt. Merapi, for example, was surrounded by huge number of residents. When it errupted in 2010, a million people were displaced (compare to major volcanic eruption in Japan, 2011, which displaced "only" 90 people).

This creates big problem for government and disaster manager to provide shelters for the evacuee. To overcome the problem, Local Disaster Management Agency of Sleman created "sister village program". This program enables people from disaster affected areas to move to the nearest safe village. The program has mapped designated emergency meeting locations, suggested route and destination for each family in hazardous areas when they have to evacuate.

Through this program, people in safe area will help their neighbour village by providing them with accomodation and basic needs.

The sustainability of community based disaster preparedness lies in empowerment and participation of the community. They are like two sides of the same coin, as one will not be effective without the other. Therefore, focusing more on a participatory approach linked to the culture of the community should be the key success of community based disaster preparedness. Therefore, capturing the local relevance and incorporating it in any national, or even international program, besides providing adequate and supportive facilitators, has to be dealt in a very delicate manner to encourage community participation.

Here, community based disaster preparedness looks at local knowledge and local wisdom as important points for the following two reasons. First, they are hidden in people's daily life, thus it is difficult to share without installing the designated device, and secondly, the end-victims of a disaster are none other than community people, and they are eventually responsible for their own survival and saving their property. Therefore, their ideas, their attitudes and their questions should be thoroughly taken into account in the management process.

People have gained experience in dealing with disasters because they have had to, and the knowledge and expertise they have acquired are invaluable to effective disaster preparedness. This local knowledge, including wisdom obtained from indigenous populations, is a welcome supplement to scientific knowledge to build strong disaster preparedness management.

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[17] Disaster Preparedness Training Programme International Federation of Red Cross and Red Crescent Societies. 2000

Financing Preparedness

There is a growing acknowledgement that the current business model for humanitarian assistance does not adequately prepare for disasters. In the absence of preparedness actions, it costs more and takes longer to respond to humanitarian needs when a disaster strikes and when humanitarian needs peak. While disaster relief captures the imagination of the public, pre disaster activities often rank relatively low on public agendas. Relief and rehabilitation constitute the primary form of disaster management and account for most of spending on disaster-related activities annually, leaving a very low balance for preparedness and mitigation as illustrated in Figure 10 below.

Figure 10. Pre Disaster Activities is Only a Tiny Fraction of Total Assistance
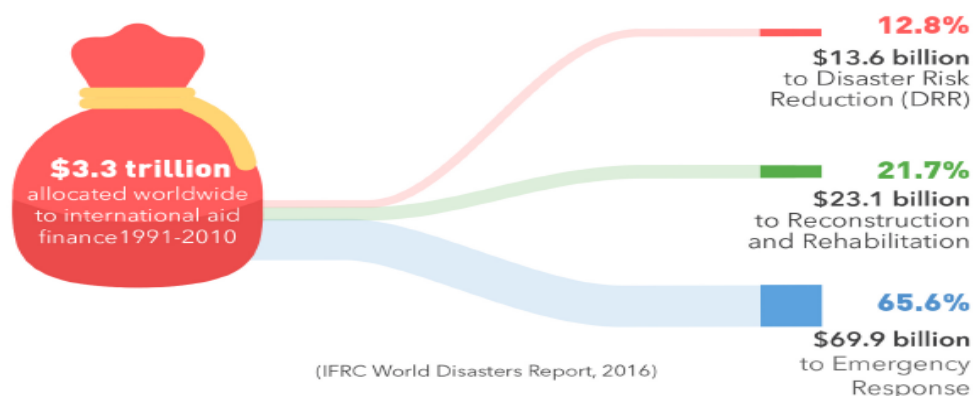
Investing in preparedness makes sense in many ways. Cost-benefit analyses suggest that appropriate investments in preparedness and mitigation could substantially reduce the burden of disasters. It is evident, a dollar invested in disaster preparedness and mitigation will prevent four to eight dollars in disaster losses. Donors will still need to respond to emergency needs. But preparedness, rooted in comprehensive risk and contextual analysis can maximise the potential of response funds to meet humanitarian needs in a more timely, appropriate and effective manner.

Government, commonly becomes the leading party in providing source of fund for disaster preparedness activities/programs. Government of Bangladesh and Guatemala, for example, have provided funds for preparedness phase in their government annual budget. Besides, in Bangladesh, some international agencies or donor funds, like climate change fund, green climate change fund and carbon emission fund are also used for disaster preparedness.

Another example can be seen from the Philippines. The National Government is required to appropriate for the National Disaster Risk, Reduction and Management (DRRM) Fund and allocated to various National Government Agencies that are invloved in dealing with DRRM activities/initiatives. Further, Republic Act 10121, known as the Philippines Risk Reduction and Management Act of 2010, has stated that DRRM Fund shall be used for disaster risk reduction or mitigation, prevention and preparedness activities. It can also be utilized for relief, recovery, reconstruction and other work or services in connection with natural or human-induced calamities which may occur during the budget year or those that occured in the past two years from the budget year. Of the amount appropriated for the NDRRM Fund, 30 per cent shall be allocated as Quick Response Fund or standy-by fund for relief and recovery programs in that other situation and living condition of people in communities or areas stricken by disasters, calamities, epidemics or complex emergencies may be normalized as quickly as possible. On the other hand, each Local

Government Units (LGUs) is required to appropriate at least 5 per cent of the estimated revenue from regular sources for the local DRRM Fund.

Prepositioning emergency relief through a regular logistical chain and training national and local capacity in an area that is prone to recurrent disaster clearly will cost less than flying in emergency relief and international experts during an emergency. Similarly, failure to make adequate financial provision against risk is extremely costly for individuals and govenments who face a crisis as well as for donors. The cost of responding to a disaster is greater when no one was prepared for it. Disaster preparedness funding can take many forms, of which some examples are listed in Table 4 below.

Table 4. Probability Use of Disaster Preparedness Fund

Preparing Funds for an Early Response	Preparing Partners for Early Action and Immediate Response
Emergency financial reserve It is available for unforeseen events requiring urgent funding. Any leftover funds are released at the end of each financial year and made available for regular activities, if no crisis requiring them occurs in the budget cycle. Emergency reserve provides a degree of financial preparedness: funds are available, can be released rapidly and help to shorten lag time between the crisis onset and delivery of aid funds. Good practice is to create drawdown arrangements with humanitarian partners.	Emergency supply pre-positioning and training Demand for relief materials spikes in crises, as does the price of commodities and transportation. Stockpiling critical supplies in strategic locations in anticipation of future emergencies is a traditional preparedness activity. Most countries supply items through a national disaster management agency or related ministries. Pre-positioning items and training field staff to respond can address regular and foreseeable humanitarian needs.
Building contingent capacity for disasters into planning process Development planning processes rarely plan for and build in contingent financing capacity against risk, even in countries where shocks are common and predictable. It is, therefore, good practice to ensure that contingency planning for known risks, such as seasonal hazards like droughts and hurricanes, are systematically included in development and humanitarian plans. These contingency sections of the overall plans should also have potential funding sources attached, so that when disaster strikes relief providers know immediately where funding for the response will come from, and do not have to undertake a lengthy appeals process.	Forecast-based financing Forecast-based financing is an innovative approach that triggers humanitarian action and funding for preparedness, based on forecast of extreme weather and climate conditions. Humanitarian responders, meteorological services and communities agree on specific preparedness actions that are worth carrying out once a forecast reaches a certain threshold of probability. Each action is allocated a budget and funds are disbursed automatically once the threshold is reached, according to predefined standard operational procedures.
Disaster relief emergency fund (DREF) The IFRC established DREF to provide immediate financial support to National Red Cross and Red Crescent Societies. The DREF acts as a loan facility only for those national societies in countries affected by a disaster. Both loan and the grant facilities are also used to help national societies prepare for imminent crises.	

Box 9 presents an example of innovative financing that combines preparedness, resilience building and early action, based on weather forecast.

1.6   Mapping out the actors and their responsibilities in alleviating the crisis

Disaster management is commonly institutionalized with the creation of any specific agency/institution. This may indicate a change in orientation from specialized preparedness for single or narrowly defined categories of hazards toward an all-hazard approach that includes potential threats to life and property.

Emergency preparedness should be a co-operative effort in which the users and beneficiaries of the plan are the stakeholders who have an interest in ensuring that the plan works well and do not lead to chaos. This is about finding resources and ensuring that the assemblage of response units, plans, and initiatives is generally going in the right direction so that it will meet the needs of population affected by disaster.

Generally, emergency planning should promote interorganizational coordination. This obviously should include public safety agencies such as disaster management, fire department, police, and emergency medical services. However, it should also include organizations that are potential hazard sources, such as hazardous materials facilities and hazardous materials transporters

(pipeline, rail, truck, and barge) and organizations that must protect sensitive/vulnerable populations, such as schools, hospitals, and nursing homes.

Coordination is required because emergency response organizations that differ in their capabilities must work in coordination to implement an effective emergency response. To perform their functions effectively, efficiently, and promptly requires members of the community emergency response organization to be aware of one another's missions, organizational structures and styles of operations, communication systems, and mechanisms for allocating scarce resources. Table 5 indicates the capacity and involvement of actors in emergency response.

Table 5. Threshold of Capacity in Emergency Response

Local incident	Local response
Small regional incident	Co-ordinated local response (regional response)
Major regional incident	Intermunicipal and regional response (regional response)
National disaster	Intermunicipal, regional, and national response (national response)
International catastrophe	Intermunicipal, regional, and national response with international assistance (national response)

Therefore, one source of complexity in contingency planning is the need to integrate several dimensions into the programmed emergency responses, i.e.:

- *Hierarchical divisions* refer to the tier of government – from national, through regional, to local

- *Geographical divisions* indicate the spatial jurisdictions to which plans refer, and possibly also to questions of mutual assistance

- *Organizational divisions* refer to the different agencies that participate in emergency response, such as "blue light" services (police, fire, and ambulance), technical groups and volunteer organizations

- *Functional divisions* indicate the different fields involved, such as government, health care, public order, public works, economy and employment, finance, and private sector.

Government

When disasters threaten or strike a jurisdiction, people expect their leaders to take immediate action to deal with the problem. The government is expected to marshal its resources, channel the efforts of voluntary agencies and private enterprise in the community, and solicit assistance from outside of the jurisdiction if necessary.

Government of the affected area has the primary role in the initiation, organization, coordination and implementation of humanitarian assistance within its territory. When the capacity of local and national government is surpassed, the timely involvement of external actors including governmental organizations, the private sectors, NGOs and civil society groups can significantly alleviate the

hardship suffered by afflicted communities. Therefore, linkage between the government and those external actors should also be clearly articulated in advance.

In most cases, responsibility for the overall coordination of disaster preparedness activities is assigned to one government department (for example the Prime Minister's Office) as well as an implementation authority (e.g. a designated disaster management office or other authority). However, it may be necessary to account for specific types of emergencies that may require different agencies assuming authority (e.g. outbreak or pandemic that may require greater leadership from the Ministry of Health).

Disaster Management Office/Agency

Disaster management is the primary responsibility of the respective Disaster Management Office/Agency of an area/country. It should set up the legal and organizational framework as well as required resources. For all types and magnitudes of disasters, Disaster Management Office/Agency should seek to provide a coordinating role and pass on information on the needs of the affected communities. The Federal Emergency Management Agency (FEMA) is an example of Disaster Management Office in the United States. In some countries, e.g. Philippines, there is no separate Disaster Management Office. In these countries, disaster management functions, particularly, the coordinating functions are executed by an ad-hoc body or a Council composed of relevant agencies involved in disaster management by virtue of their respective mandate.

Government of Guatemala, for example, has built System of the National Coordinator for Disaster Reduction (CONRED System) and assigned Executive Secretariat of the National Coordinator for Disaster Reduction (CONRAD SE) to deal with disaster-related issues. Regarding the matter, National Response Plan of Guatemala has stipulated an organizational structure based on the incident command system which delegates functions and responsibilities to the institutions at all levels. Many line ministries support the plan, such as Ministry of National Defense, Ministry of Public Health and Social Assistance, Ministry of Education, Ministry of Public Finance, Ministry of Communication, Transportation and Public Works, Ministry of the Interior, National Fire Brigades, Assembly of President of Professional Associations, and Coordinating Committee of Agricultural, Commercial, Industrial, and Financial Associations.

Local Community

Each of emergency plannings is associated with a threshold of capability, which is determined by the availability of trained personnel, expertise, equipment, supplies, communications, vehicles, and buildings. If the magnitude of the emergency exceeds or overwhelms local capabilities, then it is necessary to invoke higher levels of response. However, these should always aim to reinforce, not supplant the local ability to respond to the emergency. Supplanting local resources, decision making capabilities, and responses will only leave the local area weaker and less able to manage the longer term aftermath and any emergencies that may occur in the future.

Supreme Audit Institutions

Supreme Audit Institutions (SAIs) play a major role in auditing government accounts and operations. SAIs have different mandates but similar responsibilities to provide legislatures and society with the information they need to hold government accountable.

In this context, SAIs play a central role in holding governments to account. SAIs can play its role towards improving the economy, efficiency and effectiveness of these initiatives as well as better utilisation of aid and fund. The intervention of SAIs would also help to ensure that disaster preparedness management activities are resilient and sustainable and are given due importance.

SAIs' mandate

The extent of SAIs engagement in the audit of disaster preparedness management would depend on their mandate. Audit mandate can permit and encourage broad audits encompassing most or all of the activities and organizations involved in disaster preparedness management, or they can prove an obstacle to complete audits of full scale disaster management.

Depending on their mandate and also nature of disaster preparedness management activities in the country, SAI may choose to conduct financial, compliance or performance audit of disaster preparedness management.

While it may not be the primary responsibility of the SAI to detect fraud and corruption in the audit of disaster preparedness management, SAI should be aware of the risk of fraud and corruption. SAIs can urge government to prepare for these risks by proposing the development of an anti-fraud and corruption strategy. To do this, SAIs can evaluate the adequacy of controls already in place and where necessary recommend improvements to them. Where appropriate, SAIs can also recommend the development of additional controls specifically designed to prevent, detect and respond to identified risks in a manner consistent with the legal and regularity framework.

International Community

When government's efforts fail or its resources and capacities are insufficient, international efforts are requested. This may take the form of assistance from other countries or of international organizations or institutions. However, such efforts or interventions should be undertaken based on agreed terms of involvement.

Volunteer

Volunteers commonly collaborate with local governments, emergency managers, and other non profit organization during and after a disaster. Therefore, it is essential to cultivate these kinds of relationships in a pre disaster environment. The clumsy coordination, response, and recovery efforts needlessly contributed to loss of life. These highlights the need for strong

Photo: NGO participates in alleviating crisis

communication and preparation before high stress disaster situation.

There are two categories of disaster volunteers: affiliated volunteers and spontaneous unaffiliated volunteers. Affiliated volunteers work with specific agencies and have been trained in disaster-response techniques. Because they have been training and are known to the agencies, they usually require little supervision. Spontaneous unaffiliated volunteers, on the other hand, are ordinary citizens who want to help in the aftermath of the disaster. Therefore, despite their best intentions, spontaneous unaffiliated volunteers can be hard to manage if there is no plan for doing so in place.

CHAPTER 2
FROM PANIC TO PLANNING

The year 2016 may well prove to be a turning point in how humanitarian aid responds to crises. For one, the need is great: forced migration from conflict is at its highest since World War II (IDMD, 2016); the number and scale of disasters triggered by natural hazards are increasing (UNISDR, 2016); and 2015 was the hottest year ever recorded (NASA, 2015).[18] World Economic Forum: Global Risks Perception Survey 2016 also showed that climate change and rising cyber dependency have become trends that determined global development.[19] Combined at times with growing civil instability demonstrate that the need for disaster interventions will continue to grow. Some even argue that radical change is needed because the formal system faces a crisis of legitimacy, capacity and means, blocked by significant and enduring flaws that prevent it from being effective.

Focusing on disasters after they occur is essential from a humanitarian point of view, but not sufficient for reducing their tragic consequences to people, economies and the environment. Identifying and measuring risks and vulnerabilities before a disaster occurs – and prepare for it – are essential tasks for effective disaster management. Thus, beside getting informed on a few basic rules when it comes to preparedness, it is also important to develop preparedness approach based on hazard types. This session will provide readers with some preparedness examples for some types of disasters.

2.1 Prepare for natural disasters

Scientific research suggests that climate change has the potential to affect ecosystems, water resources, food production, human health, infrastructure, energy system, etc. Evidence shows that over the past two decades, the number of recorded disasters has doubled from approximately 200 to over 400 per year. It is also believed that nine out of every ten of these disasters have been climate related.

The increase in disaster frequency was largely due to a sustained rise in the number of climate change disasters, such as storms and flood. EM-DAT recorded nearly 240 climate-related disasters per year before 2000, compared to 341 per year after that date, a 44 per cent increase.[20] Current projections regarding climate change suggest this trend is set to continue and that weather-related hazard events will become more frequent and more volatile. In this case, climate change may increase disaster risk in two ways: by increasing weather and climate hazards and by increasing the vulnerability of communities to natural hazards.

Flood

Flood is the most common natural disaster in many countries. Flood is believed to be a temporary overflowing of water onto land that is normally dry. It may occur during any season and in several ways, including the following:

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[18] World Disaster Report. Resilience: saving lives today, investing for tomorrow. IFRC. 2016

[19] The Global Risks Report 2017: 12th Edition. World Economic Forum

[20] The Human Cost of Natural Disasters 2015: a Global Perspective. CRED. 2015

- Rivers and lakes cannot contain excessive rain or snowmelt.

- Excessive rain or snowmelt cannot be fully absorbed into the ground.

- Waterways are blocked with debris and overflow.

- Water containment systems break, such as levees, dams, or water or sewer systems.

- Strong winds from tropical storms or hurricanes cause a storm surge by pushing seawater onto land.

Photo: Flood in Republic of Azerbaijan

Flood can occur slowly as rain continues to fall in many days. This type of flooding, sometimes called a slow-onset flood, can take a week to develop and can last for months before floodwaters recede. Meanwhile rapid-onset flood occur more quickly, typically within hours or days. These types of floods usually occur in smaller watersheds experiencing heavy rainfall, particularly in mountainous and urban areas. Some rapid-onset floods, known as flash flood, occur very quickly with little or no warning, such as when dams or water system break.

The physical destruction caused by flooding depends on the speed and level of the water, the duration of the flood, terrain and soil condition, and the built environment (e.g. buildings, roads, and bridges). Flood-related injuries and deaths are often the result of individuals trapped in floodwaters. Therefore, having sources for information, preparing home or workplace, developing an emergency communication plan, and knowing what to do when a flood is approaching can save lives and property. Table 6 shows various flood emergency preparedness activities from the individual to the national level.

Table 6. Flood Emergency Preparedness Activities at Various Levels

Individual, family and household level	Community or village level	Municipality, district, province and national level
▪ Know the risk: drowning, waterborne diseases, electrocution, poisonous animals ▪ Install protective railings around the house ▪ Scout for safe areas and know how to get there ▪ Know what to do when warning is received ▪ Know whom to contact in case of emergency ▪ Keep life jackets or buoys or tires ready for use	▪ Identify and maintain safe havens, areas and temporary shelters ▪ Put up signs on routes or alternate routes leading to safe shelters ▪ Inform the public of the location of safe areas and the shortest routes leading to them ▪ Have all important contacts ready and have a focal point in the village ▪ Make arrangements for the set up of teams in charge of	▪ Determine roles and responsibilities of each agency ▪ Prepare maps to provide essential information and data on current situation and to plan for assistance in those areas ▪ Make sure that critical roads are built up to certain height ▪ Identify new safe areas and maintain existing shelters, making sure they have sanitary and other basic necessities ▪ Implement public awareness activities to create a proactive and prepared society

▪ Keep first aid kits raeady for use	health issues, damage and need assessment	▪ Educate the public on what to do/not to do
▪ Store clean water and food in a safe place	▪ Set up community volunteer teams for a 24-hour flood watch or keep communication channels open to disseminate warnings	▪ Educate the public on environment management, water resource use and land use planning
▪ Listen to daily flood forecasts		▪ Stockpile relief goods
▪ Move valuable items to higher ground	▪ Distribute information throughout the communtiy	▪ Prepare resource inventories
▪ Get ready for evcuation		▪ Plan resource mobilization
		▪ Set up emergency teams
		▪ Conduct drills for search and rescue teams
		▪ Make sure that communications channels are functioning well
		▪ Issue orders for various agencies and organizations to get prepared
		▪ Disseminate public safety information through the establishment of early warnig system
		▪ Specify the source and actions to be taken immediately after receiving warnings.

Source: Flood Management Planning. World Meteorological Organization 2011

Flood risks increases with higher population density; increasing values of economic activity and infrastructure in flood prone areas; and various needs for tourism and leisure that accompany development. A strategy to decrease risks from flooding through structural and non structural measures can provide only a partial safety for individuals inhabiting floodplains. When protection fail, damage is multiplied owing to increased investments made in floodplains by individuals who live behind protective structures (for example dykes and embankments).

Flood preparedness planning is required at several levels: national, state, district, sub-district and community level. Although flood emergency plans are generally developed for emergencies at specific geographical locations, such plans should be developed in parallel with basin-wide flood management planning. Figure 11 illustrates the interaction between basin flood management and flood emergency management planning.

Figure 11. Interaction between Basin Flood Management and Flood Emergency Planning
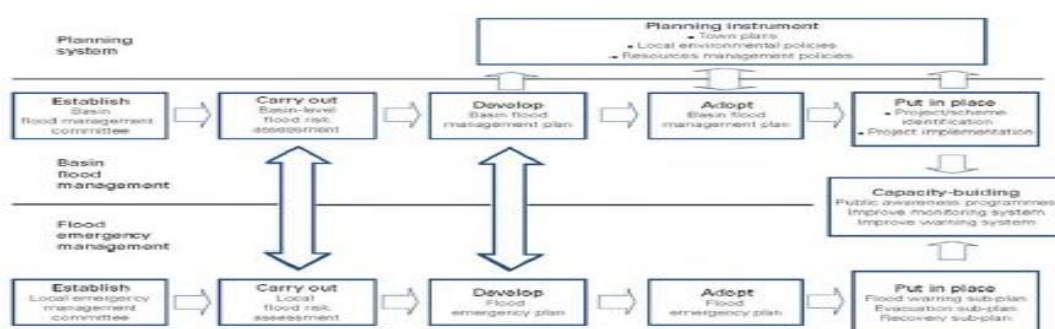
Source: Flood Management Planning. World Meteorological Organization 2011

Formal advanced plan for flood has the advantage that those involved are aware of the most important steps to take and have adequate resources on hand. To develop a flood preparedness plan, consider taking the following things:

- Understand the potential flood events to which low lying areas are exposed. It is critical to know how much time relevant parties will have to put the plan in place. Important aspects include warning time, how fast the water will rise, and how long it will last

- Ensure a reliable method of flood warning exists

- Try to organize actions into indiviual steps

- Be alert to the resources available day and night and make sure all time periods are adequately covered

- Where possible, take advantage of make-up capacity at "sister operations", subcontract capabilities or other possible alternatives

- Differentiate between normal preparedness (routine activities commonly performed and communicated by in charge department, e.g. Water Division) and emergency preparedness

Box 11 shows an example of flood preparedness plan developed in Jakarta, capital city of Indonesia.

Box 11. Preparedness Plan for 2017 Flood Management in Jakarta: Case Study from Indonesia

Government of Jakarta Province had stipulated Local Government Decree Number 15 Year 2017 on the Contingency Planning for Managing Flood in Jakarta. The plan was developed to (a) identify several areas risky for flooding, (b) establish strategies and policies for managing flood, (c) synergize the role of government and community to manage flood, and (d) determine operational plan for managing flood.

The scenario was developed based on the highest rainfall during 2017 as basic assumption and elaborated potential impacts of the flood to people, region, vital object, and transportation. Based on the analysis of potential flood, Government of Jakarta Province determines three scenarios including flood preparedness, emergency response, and transition to recovery.

Based on the stipulated scenarios, the plan has included strategies and efforts to meet minimum service standard per cluster, i.e. (a) search and rescue, (b) evacuation and protection, (c) health, (d) logistics, (e) facilities and infrastructure, (f) education, and (g) community participation.

Each cluster has also specified emergency situation; activities; coordinator of each activity; supporting units; command function; estimated need, personnel, expertise, facilities and infrastructure, a designated emergency meeting location, etc. for the developed scenario.

Source: Local Government Decree Number 15 Year 2017

Moreover, Box 12 provides an example of building disaster-resilient communities in flood-prone areas in Philippines.

Box 12. Philippines Flooding: Disaster Preparedness

Approximately 20% of Metro Manila is flood-prone, with some cities more vulnerable than the others. Flood mitigation programs had been implemented since the 1970's. However, rapid urbanization, encroachment into flood-prone areas, climatic changes, and land use changes have resulted in an increase of flood risk and flood-related losses.

Asian Development Bank (ADB) conducted pilot project that was originally focused on helping the community increase their flood preparedness through workshops on disaster risk reduction and assistance to construct a livelihood center on stilts. In response to the priorities identified by the residents, the project also funded the construction using local, low cost materials and technologies. A disaster risk assessment manual and toolkit on developing disaster-resilient construction materials and technologies in the local language were also produced.

Severe winter

Photo: Icing in the Republic of Moldova

Severe winter weather may knock out power, public transport and communication services. Heavy snowfall and extreme cold can even bring entire regions to a standstill. Winter storm has also been labelled as "deceptive killers" because most deaths are indirectly related to winter storm. This is because winter storms create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storm and blizzards can bring extreme cold, freezing rain, snow, ice, and high winds, or a combination of all of these conditions.

Planning and preparing can make a big difference in safety and resiliency in the wake of a winter storm. The ability to maintain or quickly recover following a winter storm requires a focus on preparedess, advanced planning, and knowing what to do in the event of winter storm. Actions to prepare for severe winters are drawn in Table 7 below.

Table 7. Actions to Prepare for Severe Winter

Planning	Coordination	Facility and Service Area	Personnel	Power, Energy and Fuel
▪ Actively monitor weather conditions ▪ Review and update utility's emergency response plan and ensure all emergency contacts are current ▪ Conduct briefings, trainings and	Coordinate with relevant authorities to discuss: ▪ response activities, roles and responsibilitiesand mutual aid procedures ▪ full scale exercises ▪ interconnections between systems and agreements with necessary	▪ Inventory and order extra equipment and supplies as needed ▪ Ensure communication equipment works and is fully charged ▪ Prepare equipment and vehicles to start and run in cold weather	▪ Identify essential personnel and ensure they are trained ▪ Establish communication procedures with essential and non essential personnel ▪ Ensure all personnel are familiar with emergency	▪ Documemt power requirements of the facilities ▪ Ensure hazardous materials are located in safe zone ▪ Develop a back up fueling plan

exercises to ensure utility staff is aware of all preparedness procedures ▪ Conduct a hazard vulnerability analysis	approvals to activate the alternate source ▪ communication protocols and equipment to reduce misunderstandings during the event ▪ potential distribution of aid ▪ prioritization of utility	▪ Develop a map of all system components and prepare a list of places for each facility ▪ Consider installing wind or snow drift barriers at critical facilities	evacuation and shelter in place procedures ▪ Establish alternative transportation strategies ▪ Identify possible staging areas for mutual aid crew if needed in the response	

Box 13 below gives example on early warning issued by authorized party.

Box 13. Watches and Warnings for a Winter Storm: FEMA

The National Weather Services (NWS) provides alerts and warning for all hazards through a National Oceaninc and Atmospheric Administration (NOAA) Weather Radio (NWR) receiver. There are radio receivers that are designed to work with external notificationdevices for people who are deaf or hard of hearing. Besides, community should learn the differences between Advisories, Watches, and Warnings (issued by NWS) which describe changing winter weather conditions as follow:

ADVISORY — Winter Weather Advisories are issued when snow, blowing snow, ice, sleet, or a combination of these wintry elements is expected but conditions should not be hazardous enough to meet Warning criteria. Be prepared for winter driving conditions and possible travel difficulties. Use caution when driving.

WATCH — Winter Storm Watches are issued when conditions are favorable for a significant winter storm event. Heavy sleet, heavy snow, ice storms, blowing snow, or a combination of these events are possible.

WARNING — Winter Storm Warnings are issued for a significant winter weather event including snow, ice, sleet, blowing snow, or a combination of these hazards. Travel will become difficult or impossible in some situations. Delay your travel plans until conditions improve.

Source: https://www.fema.gov/media-library-data/1494008826172-76da095c3a5d6502ec66e3b81d5bb12a/FEMA_2017_WinterStorm_HTP_FINAL.pdf

Drought

Drought, sometimes, is considered a normal, recurring feature of climate; it occurs in virtually all climatic regimes. The effect of drought accumulate slowly and its impacts are spread over a larger geographical area than damages that result from other hazards. Of the many climatic events that influence the earth's environmental fabric, drought is perhaps the one that is most linked with

Photo: Drought in Somaliland, www.oxfam.org

desertification. Drought differs from aridity in that the latter is restricted to low rainfall regions and is a permanent feature of the climate.

Drought may disrupt cropping programs, reduces breeding stocks and threatens permanent erosion of the capital and resource base of farming enterprises. Continuous droughts stretching over several years in different parts of the world in the past significantly affected productivity and national economies.

Drought affected more than one million people between 1994 and 2013, or 25 per cent of the global total. This is despite the fact that droughts accounted for just 5 per cent of disaster events in this period. Evidence showed that some 41 per cent of droughts were in Africa.[21] The World Bank's recent report indicates that droughts will likely to increase in severity in southern Africa, the United States, southern Europe, Brazil, and Southeast Asia, amongst other areas, translating to increasing evaporation and dry periods, reduction in arable land, and ultimately greater food insecurity. The likely intensification of extreme droughts from climate change in many regions accross the planet has magnified the importance of proactive measures to increase resilience to the expected impacts.

The traditional approach to drought management has been reactive, relying largely on crisis management. This approach has been ineffective because response is untimely, poorly coordinated and poorly targeted to drought stricken groups or areas. Accordingly, in case of drought, drought preparedness, and the policies which facilitate its implementation, can increase adaptive capacity and resilience of water resource management. Proactive drought preparedness and risk management measures can also purportedly help reduce economic losses and costs associated with more reactive disaster response and recovery.

The United States, for example, has developed 10 steps drought preparedness planning as follows:[22]

- Appoint a drought task force

- State the purpose and objectives of the preparedness plan

- Seek stakeholder participation and resolve conflicts

- Inventory resources and identify groups at risk

- Develop organizational structure and prepare the drought plan

- Identify research needs and fill institutional gaps

- Integrate science and policy

- Publicize the drought plan and build public awareness

- Teach people about drought

- Evaluate and revise drought preparedness plan.

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[21] The Human Cost of Natural Disasters 2015: A Global Perspective. CRED. 2015

[22] Drought Preparedness and Drought Management. M.V.K. Sivakumar and Donald A. Wilhite. Downloaded from https://www.researchgate.net/profile/Donald_Wilhite/publication/267362571_Drought_preparedness_and_drought_mana gement/links/558952ce08ae2affe71444de/Drought-preparedness-and-drought-management.pdf

The two following boxes provides examples of drought preparedness carried out by Government and corporation.

Box 14. Prolonged Drought Preparedness: Lesson Learned from Brazil

Large portions of Brazil's Northeast have experienced the worst drought for the past 100 years, especially during 2013 in term of water availability, proving devastation to some agricultural, livestock, and industrial producers. It has caused a lack of drinking water in residential wells and left dams and streams completely dry. The impacts of the recent droughts are not only manifested throughout the economy, but also exacerbate many social problems through the indebtedness of farmers, migration, disease, and malutrition, among others.

There have been recent efforts to shift Brazil away from reactionary drought response (ad hoc drought relief) and sole dependence in the long term on infrastructure solutions to mitigate the drought impact/proactive management (e.g. through improved monitoring, decentralization and democratization of water resource management, etc.), and there is a growing interest in improving coordination and institutionalizing these elements into a coherent drought policy, both at the national and sub national levels.

Drought preparedness in Brazil involves:

- monitoring and early warning/prediction

    In Brazil, drought monitoring and early warning is supported by an array of various ministries and agencies which deals with some sectors, namely weather and climate forecasting, water resource information, agrometeorological information, and research.

- vulnerability/resilience and impact assessment

    At the national level, vulnerability/resilience assessments have not been formalized, nor have the networks for monitoring and evaluating associated vulnerability indicators. The Brazilian Atlas on Natural Disasters has been produced. Meanwhile, raising awareness of the importance of exercises is carried out participatory.

- mitigation and response planning

    The federal government recognizes one of two special states that can be declared by the Mayor of an affected region during a drought event (i) a situation of emergency (less severe) or (ii) a state of public calamity (more severe). However, the classification of the disaster is really assessed on a case-by-case basis. Funds allocated for relief action are based on the severity and according to the available budget.

    Broadly on mitigation policies, there are several efforts that could eventually be integrated into a more coherent drought policy framework. Besides, the Civil House of Presidency has created an inter-ministerial committee to monitor and coordinate actions for specific drought response in semi-arid region carried out by the federal, state, and municipal governments.

Source: Drought preparedness in Brazil downloaded at
https://reader.elsevier.com/reader/sd/pii/S2212094713000340?token=4CD8BD7A56CD20CF141EFD28AE95D96F0D9D24
4652C7AE949CDD296A339C6E7C3EE8852B81AF2D3103ECE4F2261F66DA

Box 15. Drought Preparedness Plan for City West Water Corporation: a Study from Melbourne

City West Water Corporation, South East Water Corpporation, and Yarra Valley Corporation (the Metropolitan Corporations) are established under the Water Act 1989 to provide water and sewerage services throughout metropolitan Melbourne.

Under their Statement of Obligations, each Corporation must prepare a Drought Response Plan and in accordance with the guidelines issued by the Minister for City West Water's Urban Water Strategy, the Drought Response Plan must form part of a Drought Preparedness Plan, also required to be developed in accordance with the Minister's guidelines. The broad purpose of a Drought Preparedness Plan is to ensure that the Metropolitan Water Corporations and Melbourne Water jointly develop their preparedness strategies to meet the agreed levels of service (Water Supply Objective) through an

Wildfires

Photo: Flames in Gippsland, Victoria, www.theguardian.com

A wildfire is an unplanned fire that burns in a natural area such as forest, grassland, or prairie. With more and more people choosing to live in fire-prone wildland-urban interface than ever before and as building development expands into those areas, homes and businesses may be situated in or near areas susceptible to wildfire.

Wildfires can occur at any time troughout the year, but the potential is always higher during periods with little or no rainfall, which make brush, grass, and trees dry and burn more easily. High wind can also contribute to spreadig the fire. Wildfires can occur at anywhere. They can start in remote wilderness areas or in national parks. Wildfires can start form natural causes such as lightning, but most are caused by humans, either accidentally or intentionally. The destruction caused by wildfires depends on the size of the fire, the landscape, the amount of fuel – such as trees and structures – in the path of the fire, and the direction and intensity of the wind. Wildfires can destroy homes, businesses, infrastructure, natural resources, and even agriculture and threaten the safety of the public and the firefighters who protect forests and communities.

While fire management agencies attempt to reduce the impact of wildfire on residents through preventative (e.g. fuel treatments) and responsive (e.g. fire suppression) actions, they cannot prevent all wildfires from causing harm to life and property. When exposed to wildfires, people can reduce the probability of loss and increase the probability of survival by being prepared. Consequently, wildfire plans are a valuable tool for people and in charge parties living and deal with fire-prone landscapes.

Preparing a plan for action is a vital guide to decision making before, during, and after a wildfire. A complete plan requires actions and roles are identified and assigned for all individuals. Multiple contingencies must be included in the plan to account for the highly vulnerable nature of wildfire, e.g. fallen trees or power lines resulting in closure of potential escape routes, fires impacting on the property from an unexpected direction, and equipment failure. Triggers for action must be included in the plan and may come from a range of sources including visual cues (smoke or flames), or information received via television, social media or radio. Most importantly any plan must identify pathways for exiting the property safely and alternate approaches should the original

plan fail.[23] Box 16 provides an example of management to protect community in case of a wildfire.

Box 16. Mexico's National Forest Fire Management Program

On average, 7,500 fires occur each year in Mexico, affecting 300,000 hectares of pasture, scrubland, forest, and regrowth. Recently, however, the country has experienced some especially bad years, including in 2017, when fires burned 715,714 hectares and killed 12 people. Extreme climate conditions and the accumulation of fuels such as dry leaves, twigs, grasses, dead trees, and fallen timber have contributed to especially severe fire seasons.

Until 2012, Mexico's national forest fire program focuses on the complete suppression of fires by contracting helicopters to douse the flames. State forest fire programs were weak and there was little institutional coordination.

In 2013, the country recognized that the total suppression of fires was not enough and set out to revamp the country' national forest fire program in the context of a changing climate. Recognizing the ecological and social functions of forest fire marked the transition from a policy of total suppression of fires to a policy of fire management.

The transition provided a unique opportunity to reform forestry policy while at the same time making improvements in operations under existing laws. The budget did not increase. Instead, the way money was spent underwent an overhaul to strengthen the two fundamental pillars of fire management: better coordination between the three levels of government and greater participation by society.

A range of measures implemented are:

- Increasing community-based fire management and training for rural crews
- Establishing agreements with federal, state and local agencies
- Increasing the number of forest firefighters from 5,000 to 22,000
- Improving the management of fuels
- Building the capacity of forest firefighters and technical staff
- Promoting public engagement.

Source: http://blogs.worldbank.org/endpovertyinsouthasia/mexico-s-national-forest-fire-management-program

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Earthquake

Photo: Liquefaction impact, Palu, Indonesia, www.bbc.com

An earthquake is the sudden, rapid shaking of the earth, caused by the breaking and shifting of underground rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds. Additional earthquakes, called aftershocks, may occur for hours, days, or even months. Most are smaller than the initial earthquake, but larger magnitude aftershocks also occur. Earthquakes can happen at any time of the year and occur without warning. Ground shaking from earthquakes can collapse buildings

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[23] Wildfire Survival Plans in Theory and Practice. Christine Eriksen, et.al. 2016 downloaded from https://ro.uow.edu.au/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=4793&context=smhpapers

and bridges; disrupts gas, electric and phone service; and sometimes trigger landslides, avalanches, and fires. In coastal areas, earthquakes under the sea floor can cause tsunamis.

Buildings with foundations resting on unconsolidated landfill and other unstable soils are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage. Nevertheless, if a community live in an area at risk for earthquakes, there are two important things that they can do, namely:

- Comply building code

   Make houses and buildings safer to be in during earthquakes and more resistant to earthquake damage by assessing their structure and contents. Make sure that they comply with the seismic provisions of local building code besides providing safe places that enable people to drop, cover, and hold on. Authorized ministries/local agencies could promote seismic design and construction guidance for residential structures or commercial buildings and monitor the implementation of that building code.

- Practice

   Everyone should know what to do in an earthquake and have practiced safe earthquake procedures regularly. Plan to follow in the event of an earthquake should also be provided by relevant party. Therefore, government should ensure that communities know what to do by drilling earthquake and evacuation plans on a regular basis.

Surviving an earthquake and reducing its health impact requires preparation, planning, and practice. Far in advance, affected community can gather emergency supplies, identify and reduce possible hazards in their home, and practice what to do during and after an earthquake. The extent to which disaster preparedness fall short in engaging communities in pre-quake preparedness activities results in an increase in the local community's likelihood of suffering from physical, financial, and emotional injuries post-quakes.[24]

Therefore, in providing effective earthquake preparedness programs, planning should be based on periodic need assessment of the communities at risk. This will allow planners to consider knowledge, attitudes, behaviors and skills of the at risk communities in preparedness goals, designs, activities and expected outcomes. These two following boxes illustrate how countries deal with earthquake.

Box 17. Earthquake Management: Study from the US

The events of September 11, 2001, drastically altered how the U.S. system as a whole would prepare for and respond to future disasters. This disaster led to the use of an inclusive authority model, whereby the federal government has an increased responsibility for disaster management, with states and localities simply carrying out policy enacted at the federal level.

In the United States, FEMA is the federal-level agency responsible for emergency management and response. Since its inception, one of FEMA's major focuses has been to increase the nation's capacity to respond to major earthquakes. To achieve this, FEMA assists in disaster preparedness development, guides the planning effort for disaster response, and institutes and maintains disaster recovery programs. FEMA also produces literature and funds research to advance general knowledge of earthquakes and ways to reduce risk (e.g., strategies to implement strict building codes).

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[24] People's Perspectives and Expectations on Preparedness against Earthquakes: Tehran Case Study. Katayoun Jahangiri et. al. Downloaded from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3134911/pdf/jivr-02-85.pdf

In response to the fact that 48 out of the 50 states are threatened by earthquakes, Congress passed the National Earthquake Hazards Reduction Act of 1977, establishing the National Earthquake Hazards Reduction Program (NEHRP). This act was meant to help governments reduce earthquake risk in seismically active areas by developing earthquake management plans and supporting research on earthquake risk reduction. The act was the lead responsibility of FEMA until the NEHRP Reauthorization Act of 2004, which reassigned lead responsibility to the National Institute of Standards and Technology, although earthquake emergency response and management, along with the estimation of loss potential, are still the duties of FEMA.

Source: https://ascelibrary.org/doi/pdf/10.1061/%28ASCE%29LM.1943-5630.0000179

Box 18. Earthquake Preparedness: Study from Tokyo

Various disaster risks lurk in Tokyo. It is even predicted that there is a 70 per cent possibility of an earthquake directly hitting Tokyo within the next 30 years. And, thus, Disaster Preparedness Tokyo is an urgent need.

Disaster Preparedness Tokyo is a Tokyo-style disaster preparedness manual that is tailored to the various local features of Tokyo, its urban structure, and the lifestyles of its residents. This manual does not just provide readers with knowledge of disaster preparedness, but also contains many specific disaster preparedness actions that readers can start taking immediately.

The manual elaborates simulation of a major earthquake. This provides readers with simulation of what to do from the moment of an earthquake occurs to evacuation and reconstruction of their lives. It also compiles things that readers can do to prepare for disasters and provides various types of knowledge and ingenuity that will be useful for readers when earthquake occurs. The manual is also equipped with illustration to explain survival tips in an easy to undertand manner.

Source: http://www.metro.tokyo.jp/english/guide/bosai/index.html

Volcanic eruption

A volcano is a mountain that serves as a vent through which molten rock and other gases escape. When pressure from the gas and molten rock becomes too great, an eruption occurs. Volcanic eruptions may be subtle or explosive and can produce dangerous lava flow, poisonous gases, and flying rocks and ash. Many volcanic eruptions may also be accompanied by other natural hazards, such as earthquake, landslides, debris flows, flash floods, fire and tsunamis.

Photo: Krakatau's eruption 2018

Against the more violent manifestation of volcanic activity, the only possible protection is escape from the threatened areas. And, thus, awareness of the need to prepare for volcanic eruptions and to provide protection against them, rather than simply to await and endure them, then, has been growing steadily throughout the world. Besides, scientific knowledge of the potentially dangerous volcanoes is sufficiently advanced to permit the elaboration of "scenario" of possible eruptions, their destrcutive effects and their social and economic consequences.

One important question which must be examined at the outset is the relation between the time scale of volcanic events and the time needed to put various protective measures (i.e. on site protection ad/or evacuation) into effect. Experience has shown that the interval between the onset of an eruption, or of significant precursory phenomena, and a violent climax, eruption, may range from a few hours to several days, weeks or months. On the other hand, the time required to put emergency protective measures into effect depends on the size of the area at hazard, the density of population and settlement, the degree of mobility of the population, the transport and communication facilities available, and the general technological level of development.

The emergency plan for each volcanic eruption contains of the following elements:[25]

- Identification and mapping of the hazard zones

  The first element of volcanic emergency plan is a map showing the hazard zones around the volcano which are liable to be affected by one or more destructive phenomena caused by volcanic activity (pyroclastic flows, mudflows, lava flows, heavy ash falls, etc.) during an eruption. Such maps normally include the subdivision of the area exposed to each type of hazard into two or three subzones corresponding to eruptions of different magnitudes.

Box 20. Hazards Zones for Volcanic Eruption of Merapi: Case fom Indonesia

Government of Sleman, Yogyakarta, Indonesia has launched map of Hazard Zones (KRB) of Merapi. This map is zoning design which includes areas prone to geological disasters, river boundaries, residential areas, agricultural areas, and community forests. The map can provide local government with consideration to clarify policies for communities and investors and determine what activities should/not be carried out within the prone areas.

The map has divided Merapi prone areas into three dangerous zones, namely (1) KRB III representing the closest areas (3km) forbidden for residential area, (2) KRB II located 3-10km from the top, and (3) KRB I located 10-15km from the top.

KRB II dan I are allowed for living and daily activities. However, people within those two KRBs must evacuate at any time ordered by authorized parties when Merapi erupted. The evacuation order to certain KRB will depend on the scenario of Merapi eruption.

Within stipulated KRBs, local government has specified evacuation shelter addressed for the evacuee and also the shortest and fastest route to the evacuation shelters.

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[25] http://www.disastersrus.org/emtools/volcano/volcano_emergency_plan.htm#Intro

- Population census and inventory of property

  In order to plan for evacuation it will be necessary to compile a census of the population in the hazard zones and to update it a least once every five years, or whenever there are signs of abnormal volcanic activity. This census will include not only the people permanently residing in the zones but those who enter them regularly, for instance for their daily work. It may also be useful to establish an inventory of animal livestock in each zone, so that arrangements can be made for their removal if time and facilities permit.

- Identification of safe transit points and refuge zones

  If the evacuation of a hazard zone is to proceed in an orderly manner, it is essential that each person in the zone knows where to go when evacuation starts. For each hazard zone (or part of each zone), the nearest easily accessible point outside the zone may be identified, to which the people should go or should be taken, as quickly as possible, and where they may assemble in safety while arrangements are made for their reception in a refuge zone.

  At each such safe transit point, arrangements will be made for evacuees to be identified so that, if necessary, a search can be made for any persons who may be missing. All evacuees, including those proceeding to their own alternative accommodation in a safe area, should register their departure from the danger zone at one or other of the transit points.

  The plan should also specify the arrangements for the transfer of evacuees as quickly as possible from transit points to temporary accommodation in refuge zones elsewhere.

- Identification of evacuation routes

  The next element in emergency planning will be to carry out a survey of the number of people to be moved to safety, the number of vehicles (and, if appropriate, boats and aircraft) available, and the serviceability and traffic capacity of each of the roads leading out of the hazard zones to the location, type and magnitude of the eruption, and according to the direction of the wind at the time. The main objective will obviously be to distribute the expected traffic flow as evenly as possible along all the escape routes which are likely to remain open. In this context, it will be advisable to consider the vulnerability of each route not only to ash falls, pyroclastic flows, mudflows or lava flows emanating from the volcano, but also to landslides and bridge or tunnel damage which may be caused by strong local earthquakes.

- Accomodation in refuge zones

  One factor in the case of volcanoes which does not normally apply to cyclone, earthquake or flood disasters, is, that the eruption may continue for many months with repeated destructive paroxysms (possible exceeding in scale the first one), and that it may not be safe to allow or encourage the return of evacuees, or to commence rehabilitation and reconstruction, for many months after the initial disaster-causing event.

Box 21. Eight Years of Refugee Uncertainty: Case of Sinabung, Indonesia

After hundred years of no eruption, Mount Sinabung in Karo, North Sumatera, Indonesia erupted in 2010. It is said that Sinabung has erupted 2,314 times ever since and keep erupting. Even today, after its long sleep, volcanic earthquake and magma activity seem to occur frequently causing people to stay in evacuation shelter for more than eight years. The authorised party has not even been able to predict when the eruption of Sinabung will stop.

Refugees started to get depressed. This is because they have to stay in such alarming evacuation shelter and they find difficulties to get money to meet their daily needs.

Local Disaster Management Agency of Karo stated that local government has planned to relocate about 1,655 householders to permanent safer location. However, this plan was hampered due to the issuance of land use permit from Ministry of Environment and Forestry.

- Rescue, first aid and hospital services

During or after an evacuation, some people known to be living or working in a hazard zone may fail to appear at any of the safe transit points or in a refuge zone, and it may be necessary to organize searches for them. There may also be people isolated in areas which are not exposed to any danger but to which the access routes are blocked by pyroclastic flows, mudflows, or lava flows. There may be need for aerial and/or marine reconnaissance missions as soon as conditions are favorable, for food supply or rescue. It will be necessary to plan what equipment will be available and how such missions will be carried out. First aid and hospital treatment will be needed mainly for respiratory problems; broken limbs, lesions and bruises; skin burns and burns to breathing passages and lungs.

- Security in evacuated zones

Unless the danger to life is immediate and obvious, people will be reluctant to leave their homes without assurances that these will be guarded against burglary and looting during their absence. Adequate precautions must therefore be taken to prevent the access of unauthorized persons to evacuated zones, and regular police patrols of the zones should be maintained as long as this does not endanger the lives of the police.

- Alert procedures within government

The emergency plan will define the responsibilities of the various departments of government in dealing with the situation and the procedures by which the various elements of the plan will be put into effect when required. In general, it will be possible to define several stages of alert, each corresponding to a different level of hazard as assessed by the scientific team monitoring the volcanic activity. The responsibility for declaring the various stages of alert will lie with a designated official, who will act on the advice of the scientific team monitoring the volcano.

- Formulation and communication of public warnings

Since the measures that can be taken to protect life and property during a volcanic eruption will affect to some degree the whole population, it is of vital importance to keep the public fully and accurately informed of the nature of the hazard and of what is being done (and what they should do) for their protection. This inevitably entails some degree of control of the information transmitted to the public by the news media. This control will usually be exercised by a responsible official on behalf of the government. In order to avoid panic or other adverse reactions to the situation, the form and content of public announcements will, as far as possible, be decided in advance of any emergency, and the public will be familiarized with the arrangements made for their information, so that they know what to expect. The details of these arrangements will vary from place to place and from country to country, according to the political and social structure of the community and the technical means available.

- Review and revision of plans

  No plan of this kind will remain forever valid, and it will always be advisable to provide for its review and revision with appropriate publicity at regular intervals, say every two or three years. Changes may become necessary as a result of progress in scientific knowledge, changes in pattern of settlement, and changes in the administrative structure of national or local government. In addition, the plan will certainly have to be revised after each eruptive episode, in the light of the practical experience gained.

One important question, which must be examined at the outset, is the realization between the time-scale of volcanic events and the time needed to put various measures into effect. Experience has shown that the interval between the onset of an eruption, or of significant precursory phenomen, and a violent climax, eruption, may range from a few hours to several days, weeks, or months. On the other hand, the time required to put emergency protective measures into effect depends on the size of the area at hazard, the density of population and settlement, the degree of mobility of the population, the transport and communication facilities available, and the general technological level of the development.

In practice, it will usually be appropriate to plan for two types of action:

- Phased response to a gradually developing volcanic crisis, during which one may expect to have warning of potentially dangerous volcanic events at least 24 hours before they occur

- Immediate response to a situation calling for the fastest possible evacuation of people by whatever means are immediately available.

The more that is known about the history of a volcano, and the greater the effort that have been devoted to scientific studies and monitoring of its behaviour, the easier it will be to foresee how much time may be available to take protective action when an eruption does occur. Box 22 provides example on the health preparedness guide for volcanic eruption.

Box 22. Preparedness Guide for Volcanic Eruptions: Latin America and the Caribbean Studies

Most active volcanoes in the world are located in Latin America and the Caribbean, and millions of people live in town and cities near them. Throughout history, some of these volcanoes have shown their capacity for destruction. The Health Preparedness Guide for Volcanic Eruptions provides support material for the preparation of health sector contingency plans for these emergencies.

The guide have five moduls, namely:

- **The health sector and volcanic risk**, presents a conceptual framework on volcanic risk, the effect of volcanic eruptions on heallth, organization of the health sector, and practical recommendations to manage volcanic risk. Concepts of epidemiologic surveillance and mental health during volcanic crisis are also presented.

- **Protection of health services during volcanic eruptions**, desribes strategies to diagnose volcanic risk, analyze health facilities' vulnerability, and plan response operations in case of volcanic eruptions. This modul also includes a guide for the preparation of the hospital contingency plan for volcanic events.

- **Damage assessment and health needs analysis during volcanic eruptions**, outlines the main aspects of the preparation and implementation of the damage assessment and needs analysis during volcanic eruptions, in the areas of epidemiologic surveillance, basic sanitation, and health infrastructure.

- **Environmental health and volcanic risk**, develops on the impact of volcanic eruptions on the environment, as well as management measures and environmental health ones for populations and health facilities.

Hurricane

Box 23. Building Code to Address Hurricane: A Preparedness for South Florida

The 1992 hurricane season in South Florida was a major turning point in how building codes would adapt to address natural disasters. Hospitals in Florida immediately started to focus on hardening their buildings, adding emergency utilities and reviewing the Florida Building Code.

The Florida Building Code has been rewritten to address the specific effects of tropical storms and acknowledges the critical need for buildings like hospitals to remain open throughout a storm. Hospitals are required by the code to describe how they plan to stay open in a disaster through their Disaster Preparedness Plan. The plan should also identify how administration anticipates supporting patients and staff.

Hurricanes are massive storm systems that form over warm ocean waters and move toward land. Hurricanes are considered to be the most violent storms on earth and consist of condensed water vapor which forms into large clouds.

Potential threats from hurricanes include powerful winds, heavy rainfall, storm surges, coastal and inland flooding, rip currents, tornadoes, and landslides. Some countries experience the most active hurricanes in September.

Predicting hurricane's path can be challenging; there are many global and local factors that come into play. The storm size and path can directly influence what sort of wind patterns guide, enhance or hinder its growth, and vice versa! Forecasters have computers that take huge amounts of data and try to predict where the storm will go and usually can calculate 2 – 3 days out fairly accurately.

One common trend seen when hurricanes are approaching is a wide-spread panic. When this happens, people rush in large numbers to get all the supplies they think they need. However, preparing ahead of time can alleviate a lot of the potential stress of a very chaotic situation. There are some preparedness effort for hurricanes:

- Prepare map of hurricanes risk for community and community plan

- Inform the community to determine how best they can protect themselves (for example familiarise them with community plan, evacuation zone, evacuation route, and emergency shelter locations nearest to the community)

- Prepare designated storm shelter to protect property

- Prepare emergency supplies

- Prepare community's warning system in cooperation with related authorised parties (e.g. NOAA weather radio, Meteorological and Climate Agency, etc.).

Box 24. Hurricane Preparedness Plan Developed by University

The preparedness plan is divided into some phases including:

- **Phase I – the six month period between December and May**

During this period, the director/his representative will review the existing plan, conduct training, update staffing changes and emergency contact information, assign emergency personnel, and coordinate with relevant authorities

- **Phase II – Hurricane advisory**

  During the period of June to November, upon the notification by the National Weather Service that a tropical storm or formed hurricane's projected track will come, the director/his representative will review the plan, alert all emergency personnel, and determine the operation status.

- **Phase III – Hurricane watch**

  When the National Weather Center declares that a hurricane watch is in effect, the director/his representative will initiate corrective action, verify assignment and availability of emergency personnel, ensure the readiness status of supporting tools and equipment, ensure contracts and purchase order are in place.

- **Phase IV – Hurricane warning**

  When the National Weather Center declares a hurricane warning, the director/his representative will ensure all operational vehicles are ready, ensure that all emergency personnel have been issued all necessary emergency equipment, and prepare to close down all building systems as necessary.

- **Phase V – Implementation of emergency support operations**

  When decision to close and evacuate the university is made, the director/his representative will ensure that all emergency personnel are in place and prepared to conduct recovery operations.

- **Phase VI – Hurricane emergency support operations**

  After the university has been evacuated and closed, the director/his representative will conduct damage assessment, develop a list of damages, prepare to implement contracts and emergency requisitions to procure needed supplies and equipment for recovery operations.

  Source: http://www.southeastern.edu/admin/phys_plant/emergpreparedness/hurricaneplan/index.html

2.2   Prepare for outbreak

Epidemics of emerging and re-emerging infectious diseases are on the increase, with devastating health, social and economic consequences. Apart from the fact that epidemic preparedness is a statutorily mandated service, a delayed response can also lead to loss of lives. Therefore, due to the nature of the outbreak, there is a need to be familiar with epidemic management framework for effective preparedness and response.

Epidemic/outbreak management has been described as the process of anticipating, preventing, preparing for, detecting, responding, and controlling epidemics in order that the health and economic impacts are minimized.[26] World Health Organization adds that the objectives of epidemic planning are

Photo: attending to an H7N9 avian flu patient in China, www.nytimes.com

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[26] Federal Ministry of Health (FMoH) National Policy on Integrated Disease Surveillance Response in Nigeria. Abuja. Federal Ministry of Health. 2009

to reduce transmission of the pandemic; to decrease cases, hospitalizations and deaths; to maintain essential services; and to reduce economic and social impact of a pandemic.

Outbreak preparedness planning is an all-embracing term that described all that needs to be done before, during, and after epidemics. It involves anticipating or predicting the occurrence of an outbreak such that it could be prevented. However, if the outbreak could not be totally prevented, it involves preparedness so that there is a readiness to respond.

From the foregoing, preparedness is a subset of epidemic management. Epidemic preparedness constitutes all the activities that have to be undertaken from the national to the health facility levels to be ready to respond effectively to disease outbreaks. The elements of an epidemic preparedness will include ensuring that routine surveillance system can detect outbreaks as soon as it occurs and that staff are organized to confirm, investigate, and respond to outbreaks.

Preparing for an outbreak needs a multisectoral approach and community involvement. A multisectoral approach means the involvement of many levels of government and of people with various specialties including policy development, legislative review and drafting, animal health, public health, patient care, laboratory diagnois, laboratory test development, communication expertise and disaster management. Meanwhile, community involvement means making optimal use of local knowledge, expertise, resources and networks.

In addition, preparing to respond to an outbreak includes the establishment of a functional state/local government area, epidemic management committees/rapid-response team, and health management team; the need to prepare an epidemic and response plan; set-up contingency stocks of drugs, vaccines, reagents and supplies; and training health-care workers both clinicians and laboratorians.

Box 25. Preparedness of EVD Outbreak: Case of Congo

Over the last three months, the Ebola Virus Disease (EVD) outbreak in the Eastern Democratic Republic of Congo (DRC) has been escalating resulting in the World Health Organization declaring the EVD outbreak in DRC as a level 3 emergency.

The epicentre of the outbreak is located around Beni, an area that experiences continuous cross-border movement of communities. As a consequence, neighboring countries, namely Uganda, Burundi, Rwanda and South Sudan are exposed to the risk of transmission and need to be prepared to tackle an epidemic at national, as well as regional level.

The National Task Force led by the Ministry of Health, supports health partners in mapping border screening centers (temperature measurement and observations of symptoms) as well as the capacities of the organizations present in Western and Central Equatoria, the locations identified as first priority.

Besides, Ministry of Health also prioritizes coordinating the response, surveillance, contact tracing, laboratory capacity, infection prevention and control (IPC), clinical management of patients, vaccination, risk communication and community engagement, psychosocial support, safe and dignified burials (SDB), cross-border surveillance and other preparedness activities in neighboring provinces and countries.

Source: https://www.who.int/csr/don/15-november-2018-ebola-drc/en/

2.3   Prepare for cybercrime

The era of cyber-disaster may finally be here since the information and communication technologies (ICT) networks, devices and services are increasingly critical for day-to-day life. In 2016, almost half the world used the internet and according to one estimate, there will be over

12 billion machine-to-machine devices connected to the internet by 2020. Yet, just in real world, the cyber world is exposed to a variety of security threats that can cause immense damage.[27]

And, thus, cyber attacks are not a matter of "if" but "when". This is due to the evolution towards e-society which has replaced persons by e-application and has interconnected all system. Unfortunately, the dynamism in the technology world is increasingly posing danger to the safety of key sectors when there is a poor security in legacy application and protocols. Besides, end users may have not yet been educated to act properly.

Unlikely physical threats that prompt immediate action, cyber threats are often difficult to identify and understand. Cyber threats include viruses that erase entire systems, intruders that break into computers and alter files, intruders using someone's computer to attack others, or intruders stealing confidential information from someone's computer. The spectrum of cyber risks is limitless; threats can have wide-ranging effects on the individual, community, organizational, and national level.[28] Since everything is interconnected, if hackers access the plans to one component, it may be interchangeable and create vulnerabilities in other processes, divisions, intranets or extranets. Therefore, implementing cybercrime preventing technologies is critical in today's world.

Box 26. The Culprit Named "Ransomware"

In 2016, nearly one percent of all emails sent were essentially malicious attacks, the highest rate in recent years. Ransomware attacks increasingly affected businesses and consumers, with indiscriminate campaigns pushing out massive volumes of malicious emails. Attackers are demanding more and more from victims, with the average ransom demand rising to over 1,000 USD in 2016, up from approximately 300 USD a year earlier.

In May 2017, a massive cyberattack caused major disruptions to companies and hospitals in over 150 countries, prompting a call for greater cooperation around the world. Interpol thinks that more than 200,000 people in more than 150 countries were affected – and things could get worse. The attack was a remarkable global event which appears to have hit first in Britain, where it effectively shut down parts of the National Health Service. This forced some hospitals to turn away patients and delay operations.

Although there is no international definition of cybercrime, UK Home Office defines cybercrime as crimes that fall into two categories, that is "offences committed using new technologies, those targeting computer systems and data such as hacking, or old offences facilitated by the use of technology such as stealing illegal images or fraud". Moreover, offences typically cluster around the following categories: a) offences against the confidentiality, integrity and availability of computer data and systems; b) computer-related offences; c) content-related offences; and d) offences related to infringements of copyright and related rights.[29] And thus cybercrime is an evolving form of transnational crime. Table 8 provides an example on how UK handle cyber crime issues.

Table 8. A Number of Agencies Dealing With Cyber Crime in UK

NFA	PCeU	SOCA
The wide ranging Government review of fraud reported in 2006 led to the creation of the National Fraud Authority (NFA)	The Government and the Metropolitan Police Service (MPS) jointly fund the Police Central e-crime Unit (PCeU). The PCeU acts	The Serious Organised Crime Agency (SOCA) is an intelligence-led law enforcement agency with harm reduction

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[27] Global Cybersecurity Index 2017. ITU. 2017

[28] https://www.readynh.gov/disasters/cyber.htm

[29] https://www.unodc.org/unodc/en/cybercrime/index.html

and the designation of the City of London Police as the national lead force for fraud. The NFA, an executive agency of the Attorney General's Office is the Government's strategic lead on counter-fraud activity.

Two key deliverables of this strategy are Action Fraud which is led by the NFA and the National Fraud Intelligence Bureau (NFIB) which is delivered by the City of London Police as part of its lead force responsibilities.

Action Fraud will provide a first point of contact for individuals and small businesses reporting fraud using the public facing name 'Action Fraud'. Action Fraud will not only provide guidance for victims of fraud but also the reports it receives will be fed into the National Fraud Intelligence Bureau. The NFIB will receive and analyse information from Action Fraud and also from a number of anti fraud organizations enabling it to provide comprehensive intelligence about fraud taking place across the country which may lead to targeted enforcement action

as the central unit for UK policing on promotion of standards for training, procedure and response to e-crime, and has brought together forces, the NPIA and other groups to develop training and to coordinate activity to build up the skill levels within policing.

The PCeU is working with Action Fraud and the City of London Police to develop a response to electronic fraud reported to the Action Fraud service and passed to the National Fraud Intelligence Bureau (NFIB). As the NFRC develops, protocols will be put in place that will set out the way that the PCeU will support the NFRC. The Unit works with SOCA, ACPO and ACPO(S) representatives, HMRC, the Crown Prosecution Service (CPS), CEOP and the NPIA, through the ACPO e-crime Committee.

responsibilities. Harm in this context is the damage caused to individuals, communities, society, and the UK as a whole by serious organised crime.

The mandate of SOCA's e-Crime Unit is to reduce the harm caused to the UK by online organised crime and is resourced to address the threat of technology enabled organised crime, and in particular to degrade criminal capability to use the Internet and IT networks as an operational enabler or means of influence. Additionally to use the internet to obtain information on serious organised crime to improve understanding of how those involved operate and to use the Internet as a tool to assist in disrupting criminal activities.

The Unit has access to the wider operational capabilities of SOCA both within the UK and in nearly forty other countries worldwide.

Note: Adapted from Cyber Crime Strategy. Secretary of State for the Home Department. UK.2010
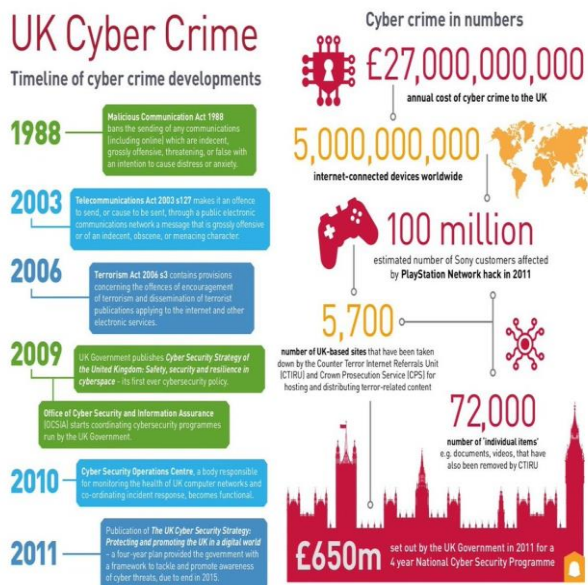
Photo: Cybercrime Infographis, www.yhrocu.org.uk

The complex nature of the crime as one that takes place in the border-less realm of cyberspace is compounded by the increasing involvement of organised crime groups. The profile of a cyber attacker may vary, but commonly associated with organized crime, terrorists, nation states, internal threats or disgruntled employees and ransom attacks. Meanwhile, cybercrimes have various types of victim impacting them in short or long term basis. Short term cybercrimes impact the daily activities of users and business. Long term impact includes national security breaches. Besides, perpetrators of cybercrime

and their victims can be located in different regions, and its effects can ripple through societies around the world, highlighting the need to mount an urgent, dynamic and international response.

Georgia, for example, established cybercrime legislation in line with the principles and rules of the Budapest Convention both in terms of substantive and procedural aspects. The Personal Data Protection Act was enacted by Parliament in 2011 and intended to ensure protection of human rights and freedoms. Meanwhile, the New Zealand (NZ) Police, through NZ Police's Prevention First National Cybercrime Strategy 2014-2017, has been introducing a 3-tiered training program for specialist cyber staff, investigators and the frontline staff. Regarding the existence of technical institutions, Egypt has provided computer emergency response team support to several entities in the ICT sector, the financial sector as well as te government sector, in order to help them tackle cybersecurity related threats. Practices for capacity building which includes developing the technical and human resources for fighting cybercrime was also carried out by Latvia, for example, through publishing a series of articles on its national CERT portal. Further, Denmark, Finlad, Iceland, Norway and Sweden have collaborated through the Nordic National CERT Collaboration which includes technical cooperation and cybersecurity exercises to assess and strengthen cyber preparedness, examine incident response processess and enhance information sharing in the region.[30]

In today's data-driven world, a reactive approach to cybersecurity will not cut it. By developing a robust, proactive cybersecurity strategy, government agencies will be better equipped to prepare for, prevent and resolve digital threats into the future. Here are five key steps government agencies can prepare to improve cybersecurity and prepare for cyberattacks:

- Undertake a risk assessment

  This can be carried out by (a) conducting a risk assessment to determine areas of greatest vulnerability and potential consequences of an attack, (b) understanding the worst and most likely scenarios to engineer defences, and (c) ensuring dialogues between security experts and stakeholders.

- Take an intelligence-led, analytics-based approach

  Effective cybersecurity can no longer rely on a "gates and guards" approach. And, thus, advanced analytics can help with cyber threat identification and intelligence.

- Invest in cybersecurity talent

  Many public service organizations are finding themselves short on the right skills and competencies to stave off digital threats. Public service leaders must allocate resources to attract and build a strong cybersecurity team.

- Increase stakeholder collaboration

  Government employees need to uderstand the risks and security protocols when using mobile devices or operating in the cloud. Therefore, employees should be educated about cybersecurity so everyone can play their part in keeping data safe and working with peer organization, academia and the private sector to minimize risk.

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[30] Global Cybersecurity Index (GCI) 2017. ITU. 2017

- Devise a cybersecurity strategy

A crisis response plan is not enough, and thus, proactive data security strategy is needed and prioritization is important.

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Box 27. Cyber Security in Australia

Cybercrime in Australia is a growing threat and is becoming an attractive way for criminals to steal information, money, or disrupt business. Unfortunately, when a cyber-attack will occur and what it might involve cannot be predicted. And thus, a cyber security policy and cyber security incident response plan may be needed to prepare for and respond to an incident fast and effectively.

A cyber security policy outines the assets to protect, the threats to those assets, and the rules and controls for protecting people and business. Meanwhile, a cyber security incident response management plan is a guide that outlines the steps to manage a cyber security incident.

Preparing to cyber security incidents may include:

- Develop policies and procedures to help community understand how to prevent an attack and to identify potential security incidents

- Identify the financial and information assets and technology that most people relied on

- Consider the risks to these systems and the steps needed to take to lessen the effects or damage

- Create roles and responsibilities so that everyone understands who to report to if an incident occurs and the recovery procedures that follow.

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2.4 Prepare for forced migration

Globally, more than 60 million people are displaced by wars and armed conflicts, violence, health epidemics, disasters and human rights violations. This is the highest level of forced displacement since World War II.[31] The number of migrants entering EU Member States has increased steadily since 2008 but reached highest record in 2015.

The most recent surge is fueled by growing numbers of Syrians, Iraqis, Libyan, Afghans and Eritreans fleeing war, ethnic conflict or economic hardship. Many are undertaking harzardous journeys across the Mediterranean to reach the EU, often resorting to using smugglers. This resulted in almost 4,000 deaths in 2015.[32] Even, it is predicted that the seismic turbulence in the Middle East will continue and indeed worsen and that an army of the order magnitude of 450,000 men would be necessarry to stabilize the conflict. Mass migration now poses the gravest threat to Europe's stability and tranquility since the end of the Cold War, and arguably since 1945.[33]

The physical difficulties of preventing them from coming are immense. The people on these odysseys are driven by motivations and passions more intense than most of us can imagine. They see the societies they are heading for offer a wealth and security unimaginable in their homelands. On the other hand, credible and coherent policies for checking or halting the flood, beyond creating some frail fences on the Eastern margins have not existed yet. Besides, the vast majority of policies, laws and procedures related to border management were designed for ordinary "peaceful" conditions. Box 28 provides an example on how Jordan dealt with refugee issues.

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[31] http://www.huffingtonpost.com/A-View-from-the-United-Nations-/disasters-are-fuelling-di_b_12121652.html

[32] Managing the EU Migration Crisis: From panic to planning

[33] http://www.dailymail.co.uk/news/article-3499652/Could-lead-war-Europe-Apocalyptic-yes-conflict-avoided-MAX-HASTINGS-says-unchecked-mass-migration-make-Europe-unrecognisable.html

Box 28. Win-win Outcome for Refugee Housing in Jordan

As large number of Syrians fled their country and sought safety and protection in Jordan one of the obvious but less-discussed issues was the impact and consequences of the lack of available accommodation in the country both for Syrian refugees and Jordanian households. According to governmental estimates, the Jordanian housing market was facing a shortfall of at least 24,000 housing units prior to the Syria crisis. The influx of Syrian refugees has created a need for an additional 90,000 unit approximately, which inflated rental price, increased competition and decreased housing standards for all.

Jordan currently hosts around 630,000 registered refugees with the Government estimating about the same number of citizens of Syria who do not consider themselves a refugee but are unable to return home due to conflict. Some 15 per cent of registered refugees live in official camps, the rest staying with friends, relatives, or most frequently, renting accomodation in Jordanian house communities with large refugee pockets across northern Jordan and in the capital city of Amman. Besides, the UN Refugee Agency (UNHCR) stated that 86 per cent of refugees live under the official Jordanian poverty level and unable to find legal income-earning opportunities and livelihoods.

Building on its experience within the Middle East region, the Norwegian Refugee Council (NRC) decided to address the complex issue through integrated approach that addresses immediate needs of the refugee households. NRC has been identifying Jordanian landlords who had started but were unable to complete their houses, and offered additional support to finalize their housing units. In exchange, the landlords commit to offering rent-free accomodation to Syrian refugees for a pre-agreed period. This approach addresses both the issue of availability of housing units and the refugee's ability to afford adequate housing.

Moreover, humanitarian crises leading to mass cross-border flows have other specificities which countries need to be ready to deal with. The starting point of crisis preparedness is solid contingency planning for a potential surge in cross-border flows. This exercise involves various actors – civil defence or a crisis management center, border guards and the police, health and social services, asylum authorities, the local government, the humanitarian organizations and the civil society.[34]

Box 29. Forced Migration: Study Case of IDMC

By the end of 2016, there were 40.3 million people living in internal displacements as a result of conflicts, violence and disasters. This number has already doubled since 2000 and has increased sharply over the last five years. In 2017, there were even 30.6 million new displacement across 143 countries and territories. 39 per cent of new internal displacement were triggered by conflict and 61 per cent by disasters. This number is the equivalent of 80,000 people forced to flee each day .

The distribution of internal displacement across the globe in 2017 mirrored the patterns of previous years. Most of that associated with conflict took place in Sub-Saharan Africa and the Middle East, although there was also significant new displacement in South Asia, and East Asia and Pacific. Displacement associated with disasters was most prevalent in East Asia and Pacific, South Asia and the Americas.

Since the publication of the Guiding Principles on Internal Displacement in 1998, programmes and policies to protect and assist IDPs have not been sufficient to cope with, much less reduce, the growing number of new displacements or the cumulative number of IDPs over time. A new approach is essential.

Authority and accountability should lie with the highest levels of government, combined with the devolution of resources and decision-making power to local authorities. To enable this, national capacity for monitoring, planning and implementation needs to be systematically built and maintained. This is because failure to address long-term displacement has the potential to undermine the 2030 Agenda for Sustainable Development and progress on other international agreements.

Countries facing internal displacement must drive policymaking. Over the coming years, countries will have to better account for IDPs and displacement risk, and make addressing internal displacement an integral part of development planning and governance at both the local and national level.

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[34] http://weblog.iom.int/humanitarian-border-management-better-response-migration-crises

2.5   Prepare for nuclear detonation

Photo: Construction Site of the Chernobyl NPP as of May 29, 2014

One of the most catastrophic incidents causing enormous loss of life and property and severely damaging economic viability is a nuclear detonation. It is incumbent upon all levels of government, as well as public and private parties within a country, to prepare for this incident through focused nuclear explosion response planning. Nuclear explosions present substantial and immediate radiological threats to life and a severely damaged response infrastrcture. Thus, preparedness to respond to a nuclear detonation could result in life saving on the order of tens of thousands of lives.

Since the Chernobyl accident in 1986, major political and technological development (such as improvements in international cooperation and advances in information technology) have provided opportunities for improving the international emergency preparedness and response system. Adequate arrangements at the national level are a precondition for a strong international preparedness and response system. However, response to a nuclear detonation will largely be provided from neighboring response units; therefore, advance planning is required to establish mutual aid agreements and response protocols. Response plans must be optimized to maximize the benefits while minimizing the total risks to the responders, including protecting responders and maximizing responder resources available for the duration of the response.

Nuclear accidents may also have transboundary effects; therefore it is important to provide adequate response based on scientific knowledge and full transparency. One of

Box 30. Zone Characterization of Nuclear Radiation

It is even stated that because of the unique nature of radiation dangers associated with a nuclear explosion, the most lives will be saved in the first 60 minutes through sheltering in place. Therefore, the zone delineations are rough approximations that can assist response planners. However, since there is no clear boundaries between the damage zones, the zones will need to be characterized based on observations by early response units and if possible by overhead photography.

Generally, the light damage (LD) zone is characterized by broken windows and easily managed injuries; the moderate damage (MD) zone by significant building damage, rubble, downed utility lines and some downed poles, overturned automobiles, fires, and serious injuries; and the severe damage (SD) zone by completely destroyed infrastructure and high radiation levels resulting in unlikely survival of victims

measures proposed in IAEA Action Plan on Nuclear Safety also correlates to emergency preparedness and response. International Action Plan for Strengthening the International Preparedness and Response System for Nuclear and Radiological Emergencies states that the international emergency preparedness and response system is deemed to comprise: (a) legal

framework provided by the Conventions, (b) arrangements for the exchange of information and resources for identifying, assessing and responding to a nuclear or radiological emergency among state parties, non-party IAEA member states, relevant international organizations and the IAEA Secretariat, and (c) preparedness arrangements to maintain the capability to respond.[35] To support these, the responsible authorities must have information (regarding the event, its development an consequences, and the response actios taken) and resources (e.g.: technical expertise; human resources and tools for acquiring and processing information and making assessments; trained personnel, equipment and facilities for carrying out response actions; financial resources).

Preparing for these incidents is always difficult, but prearranged agreements and arrangements may help to ease the initial hours of confusion. Some examples include the use of Memorandum of Understandings (MOUs) that allows for a neighboring jurisdiction to assume control of the damaged locality's operational duties. One example may include roadway network monitoring through access to transportation management centers. Another example would be the availability of pre-staged resources, including equipment needed to remove rubble, shore up infrastructure, and stabilize utilities.

Some specific issues that should be considered to prepare for nuclear detonation are:[36]

- Search and Rescue Operation

    Initially, search and rescue operations will be most efficiently and effectively engaged in non-radiologically contaminated areas by utilizing visual cues and detected radiation. Search and rescue within a contaminated area must be conducted by responders trained in radiation protection in accordance with hazardous materials standard operating procedures.

- Decontamination of critical infrastructure

    In the early phase of response, decontamination of affected areas or infrastructure should be limited to those locations that are absolutely necessary to access, utilize, or occupy in order to accomplish the life saving mission. Examples of infrastructure that may need to be decontaminated include public health and healthcare facilities, emergency services facilities, and transportation and other critical infrastructure (e.g., power plants, water treatment plants, airports, bridges, and transportation routes into and out of response areas). Affected infrastructure should be prioritized and radiation exposure rates should be estimated to determine whether postponing decontamination is preferable.

    Decontamination of critical infrastructure should be initiated only when basic information becomes available regarding fallout distribution, current and projected radiation dose rates, and structural integrity of the elements to be decontaminated. It is important first to estimate how much decontamination is required to use or occupy the areas and for how long these areas need to be used.

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[35] http://www-ns.iaea.org/downloads/rw/action-plans/ers-action-plan.pdf downloaded on 18 December 2018

[36] Planning Guidance for Response to a Nuclear Detonation. National Security Staff Interagency Policy Coordination Subcommittee for Preparedness and Response to Radiological and Nuclear Threats. 2000

- Waste management operation

An important aspect of managing waste from a nuclear explosion incident is that decontamination decisions can profoundly affect potential waste disposal options and quantities of wastes generated, and, conversely, waste disposal costs and barriers may impact the decontamination strategies. State and local waste management personnel should be incorporated into the planning process to lend their expertise to those that will be responding, to obtain an understanding of debris that might be encountered, and to help identify the appropriate equipment necessary to remove obstacles and obstructions for expedient access to victims and access to medical facilities.

Traditionally, waste management operations would begin after life saving operations, stabilization, and evidence collection. Another waste management activity that may be necessary during the initial hours is hot spot removal. State and local authorities should include waste management planning priorities in comprehensive nuclear detonation response plans.

- Selection of radiation detection systems

The need for radiation detection systems will be overwhelming and few resources will be urgently required during the first 24 hours. The categories of radiation detection systems can be organized according to the critical response mission areas. Alternatively, responders may prefer to categorize their detection systems according to functional tasks: detection, survey, radionuclide identification, and dosimetry. All radiation detection systems should be used within their functional limits and design specifications.

- Evacuation/shelter recommendation

The best initial action immediately following a nuclear explosion is to take shelter in the nearest and most protective building or structure and listen for instructions from authorities. No evacuation should be attempted until basic information is available regarding fallout distribution and radiation dose rates. When evacuations are executed, travel should be at right angles to the fallout path (to the extent possible) and away from the plume centerline, sometimes referred to as 'lateral evacuation'. Moreover, evacuations should be prioritized based on the fallout pattern and radiation intensity, adequacy of shelter, impending hazards (e.g., fire and structural collapse), medical and special population needs, sustenance resources (e.g., food and water), and operational and logistical considerations

- Early medical care

The social, psychological, and behavioral impacts of a nuclear detonation will be widespread and profound, affecting how the incident unfolds and the severity of its consequences. Among key issues are the mental health impacts on the general public, potential effects on emergency responders and other caregivers, and broader impacts on communities and society.

- Population monitoring and decontamination

The immediate priority of any population monitoring activity is identification of individuals whose health is in immediate danger and requires urgent care. The primary purpose of population monitoring following a nuclear detonation is detection and removal of external contamination. In most cases, external decontamination can be self performed if

straightforward instructions are provided. Moreover, prevention of acute radiation health effects should be the primary concern when monitoring for radioactive contamination.

- Providing emergency public information

Planners must consider options for communicating in areas where the infrastructure for electronic communications has been disabled or destroyed. Any remaining operational communications systems will be severely overloaded. Communications into and out of the impacted area via these systems will be extremely difficult. Radio broadcasts may be the most effective means to reach the people closest to and directly downwind from the nuclear explosion site. Accordingly, planners in adjacent communities should collaborate in advance to determine the assets necessary to reestablish communications after a nuclear detonation. They should also identify and remedy gaps in their capabilities.

CHAPTER 3

AUDITING EMERGENCY PREPAREDNESS: CASE STUDIES

3.1 Overview of ISSAI 5500 series

ISSAI 5500 series serve as main guidance for public sector auditors when auditing overall government disaster management. The following part will provide some evaluation on those ISSAIs.

ISSAI 5510 – The Audit of Disaster Risk Reduction

- This ISSAI mainly talks about the audit of government disaster risk reduction efforts. To have holistic understanding about disaster risk reduction program, this ISSAI is encourged to explore more about the business process, risk management of disaster management, and enriched with some examples from some countries' risk management. When we start by the "risk management" then all possible risks can be detected. The current ISSAI already identified the possible risk that should be addressed by government when implementing a disaster risk reduction program. However, to be more systematic, these risks better come from a sequenced business process.

- The ISSAI (par 10.5) mentioned the objective of financial audit as follows: Financial audits include a review of the accounts and the underlying transactions, including disaster-related expenditure and are conducted to ascertain the legality and regularity of income and expenditure. An example of a financial audit objective might be to examine the management of funds earmarked for protection against floods.

  The above objective is a bit mixed with the compliance audit. Actually, the current ISSAI have mentioned that it will be more suitable to conduct a compliance or performance audit for this subject matter. And this is true, that it is a bit difficult to distinguish the evaluation of the fairness of the use of disaster reduction fund as an independent subject matter. This is because the objective of a financial statement audit is to determine whether the financial statement as a whole are free from material misstatement, whether due to fraud or error, thereby enabling the auditor to express an opinion on whether the financial statement are prepared, in all material respects, in accordance with an applicable financial reporting framework.

  The criteria for this type of audit is free from material misstatement which are based on applicable financial reporting framework. This financial reporting framework are applicable for every account that government has in its financial statement (whether it is related to disaster risk reduction program or not). To be more easy to understand, this ISSAI is encouraged to focus on the compliance and performance audit, and when conducting the financial audit it will follow the criteria for the fairness of the financial statement as a whole.

- The current ISSAI did not discussed about the audit of government readiness for emergency situation. Meanwhile this issue is very important due to the big risk of losing lives either because of the disaster itself or because of the chaotic situation in emergency situation. It will be better if we put some degree of attention to discuss this specific topic in the ISSAI.

- Assessing fraud risk in disaster reduction program are already mentioned in this ISSAI. It is very good since the fraud incidents can hamper the effectiveness of government disaster risk reduction program. To add some more information about fraud, this ISSAI may address some examples of fraud risks in each business process of government disaster risk reduction program. It will complementing the ISSAI 5130 that will specifically discuss the fraud risk in emergency phase.

- This document is encouraged to remove some statements such as "*SAI participating in the survey and parallel audit emphasised the importance of risk assessment in auditing disaster risk reduction* "(Part 2 point 9), "*Participants in the survey and parallel audit emphasized the advantage of the performance audit approach for auditing disaster risk reduction because it allowed for more comprehensive objectives and scope*", etc.

- The part of Basis for an Audit Program are encouraged to be put together with Part 2 The Audit of Disaster Risk reduction. It will be suitable with the risk assessment part. The basis for an audit program is a sound risk assessment for each business process of a subject matter audited. The list of questions for risk assessment can be part of appendix.

- Literature review as a part of methods used for collecting and analysing data in performance auditing is encouraged to be moved as a source for obtaining background information of the subject matter to be audited. The main types of audit procedures are inspection of record and documents, physical inspection of tangible assests, observation, inquiry, confirmation, recalculation, reperformance, and analytical procedures.

ISSAI 5520 - Audit of Disaster Related Aid

- When SAI conducts a financial audit, it will audit the whole government finance. This type of audit will give an opinion whether the financial statement (as a whole) are prepared in all material respects, in accordance with an applicable financial reporting framework. It will not have a separate opinion of the disaster related aid. Instead, this audit will talk about the government's accounting treatment of its account that is related with the disaster related aid. For example:

  a) How government will record its revenue from donation which is received in cash, goods, and in kind (what is government policy in recording the non-cash donation, etc).

  b) How government will record some donation that has been commited under MoU but will be received in the next period, and how government will record their commitment to rehabilitate or to construct the infrastructure in the next period by using the disaster related aid fund.

  c) How government will account for assets given or built by donation fund either through the budgetary mechanism or non-budgetary mechanism.

  d) How matters related to the receipt and use of disaster-related aid fund will be disclosed in the notes to financial statement

  Those are some examples that will affect the fairness of the financial statement that is related to the accounting of the disaster related aid.

- Meanwhile, the current ISSAI mainly expounds on the compliance issues instead of the financial statement fairness issues when conducting the financial statement audit, as what has been stated in paragraph 13.2 "When conducting a financial audit of disaster-related aid, auditors should take account of the specific nature of disaster-related aid. The audit of financial statements could address, among other things:

  a) the requirements of the applicable accounting standards in the light of the special circumstances surrounding disasters (emergency procedures, large volumes of public expenditure during or after the emergency)

  b) the existence and operation of adequate internal control

  c) systems during the different post-disaster phases and activities (relief, recovery, rehabilitation and reconstruction)

  d) the increased risk of fraud and corruption in emergency activities

  e) whether the legislation regarding contracts provide for emergency provisions and whether this is appropriately reported in the financial statements

  f) reconciling disaster-related aid budgeted for and accounted for

  g) the possible existence of gaps in funding between executive units engaged in similar activities

  h) reconciling donors' and recipients' records and reports

  i) comparing project expenditure recorded by donors with figures for total aid.

ISSAI 5530 - Adapting Audit Procedures to take Account of the Increased Risk of Fraud and Corruption in The Emergency Phase Following A Disaster

- To be more straightforward (part 1), begin the discussion of this ISSAI directly specific to SAI's role in combating fraud in emergency phase. It is encouraged to provide examples that are specific to fraud in emergency phase.

- Before starting the discussion of the fraud risk, this ISSAI could mention the auditor's responsibility in detecting fraud when conducting an audit related to emergency phase either in financial, performance, or compliance audit.

- The reference about the types of fraud can be taken from Association of Certified Fraud Examiner (ACFE) Fraud Tree, whereas the types of fraud are grouped into Assets Misappropriation, Corruption, and Financial Statement Fraud.

- The current ISSAI already mentioned the fraud risks. In order to make it more systematic and easy to understand it is encouraged that this ISSAI explain first the business process in emergency phase, followed by the potential fraud risk that are derived from the business process, and last is the identification of the red flags for each fraud risk. The potential fraud risks can be referred from the Fraud Tree provided by ACFE. For example:

Business Process : The distribution of goods and supplies

The Fraud Risk   : Conflict of interest (under corruption category)

Red Flag   : Imbalance distribution proportion

- This ISSAI could elaborate more about the importance of evaluating the fraud risk management in emergency phase conducted by government. Enrich it with the internal control measures (examples) that have to exist for government to be effectively prevent, detect, and respond to fraud incidents.

- In addition to the above matters, this ISSAI will also be better by elaborating more on the role of "government actor "in emergency phase in order to have a picture of the responsible parties that have a duty in preventing, detecting, and responding to fraud. The duty of managing the fraud risk falls under the government, and SAI has a responsibility to evaluate whether the responsible parties have conducted their role to prevent, detect, and respond to any fraud arising in emergency phase with its special characteristics.

3.2 Types and methodology for auditing on emergency/disaster preparedness

A unique feature of disaster management is the impact it can have on saving lives and property and restoring human dignity. This is because however well-prepared governments, communities or individual plans are, they can never be prepared enough to avoid all adverse effects of major disasters. And, thus, auditors can measure the effectiveness, economy and efficiency of the disaster preparedness itself.

Depending on the SAI's mandate and also their competence and experience, SAIs can audit different aspects and elements of emergency/disaster preparedness. The scope and objectives of each audit and the way it is planned and conducted depend on the mandate of the SAI and the regulatory framework within which it operates. Besides, the type of audit may also differ based on the requirement. SAIs can carry out financial, performance, compliance or a mixture audit of disaster preparedness.

In all cases the audits should fall within the mandate given to the SAI and be carried out in accordance with the national and other elevant legislations and auditing standards which apply. Clear objectives assist auditors to focus the audit work and facilitate follow up of audit recommendations. There can be audits which are implicitly focused on efficiency or effectiveness of emergency/disaster preparedness elements/programs/activities.

Financial audit of emergency/disaster preparedness

The purpose of an audit of financial statement is to enhance the degree of confidence of intended users in the financial statements. This is achieved by the expression of an opinion by the auditor on whether the financial statements are prepared, in all material respects, in accordance with an applicable financial reporting framework, or – in the case of financial statements prepared in accordance with a fair presentation financial reporting framework – whether the financial statements are presented fairly, in all material respects, or give a true and fair view, in accordance with that framework.[37] In this case, financial audit may be relevant when emergency/disaster preparedness has affected the quality of the financial statement.

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[37] ISSAI 200/16

Performance audit of emergency/disaster preparedness

Performance auditing is an independent, objective and reliable examination of whether government undertakings, systems, operations, programs, activities or organizations are operating in accordance with the principles of economy, efficiency and effectiveness and whether there is room for improvement.[38] When conducting performance audit of disaster/emergency preparedness, auditors should bear in mind the need to make recommendations to feed into measures to prepare for the event of future disasters. In addition, SAIs may also seek to issue recommendations of general application regarding, for example, improvements to be made in human resources and organizational capacity development.

Compliance audit of emergency/disaster preparedness

Compliance audit is the independent assessment of whether a given subject matter is in compliance with applicable authorities identified as criteria. Compliance audits are carried out by assessing whether activities, financial transactions and information comply, in all material respects, with the authorities which govern the audited entity.[39] When carrying out compliance audit of disaster/emergency preparedness, auditors may seek to verify compliance with the requirements of stipulated laws and legislations.

Methods for collecting data

Methodology may be understood as a systematic approach to answer the audit question. The methods applied in an audit should therefore be closely related to the identified risks and the topic of the audit. When choosing methods for collecting data, it is also important to get an overview of sources that may provide audit evidence. Here are some of the methodological possibilities when conducting audit on emergency/disaster preparedness.

-   File examination

    Review of documents is an efficient way of collecting data, and may provide important evidence. Relevant files may include decisions of officials, 'case records' of programme beneficiaries, and records of government programmes. Prior to collecting documents, it is important to assess the nature, location and availability of the documents. However, it is important to bear in mind that document review restricts the analysis to the existing documentation. It will therefore often be necessary to collect data from other sources.

-   Interview

    Interviews are normally used to gather specific and detailed information in order to answer the audit topic. This method is commonly used as a supplement to questionnaires, and may be used in order to obtain documents, gather opinions and ideas related to the audit topic, confirm facts, affirm data and explore potential recommendations. Interviews may enter into the planning phase, or the investigation itself. It is important to bear in mind that the

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[38] ISSAI 300/9

[39] ISSAI 400/12

interviewees should, as far as possible, represent people with different positions, perspectives and insights.

- Observation

    Observation may be used to document the actual process of emergency/disaster preparedness. Observation may therefore provide physical evidence in terms of photos and recordings

- Use of statistics

    Statistics may be retrieved from the databases of the public agencies, or from central institutions producing official statistics. Although databases and statistics from secondary sources may provide valuable information, it is important to assess the reliability and relevance of the content. Statistics retrieved from databases and secondary sources may provide the basis of simple analyses such as frequencies, mean and other types of distribution. Statistics may also provide the basis of impact studies or cost-benefit studies

- Survey and questionnaire

    Questionnaires or surveys may provide the means of systematically collecting necessary information. Surveys are useful when quantifying information, and are normally used in cases when the required information is not available from other sources. When preparing a questionnaire, the auditor must decide whether to collect data from a defined population, or a sample of the population.

3.3   Audit topics on emergency/disaster preparedness

The selection of audit topics requires a thorough assessment of the relevant risk arising from the failure to prepare for emergency/disaster, assessment of materiality based on the number of people who may be affected and the severity of the harm they may suffer. The greater the risk for consequences in terms of economy, efficiency and effectiveness or public trust, the more important the problems tend to be. Auditor should select audit topics that are significant, auditable and reflect the SAI's mandate.[40]

Before embarking on an audit, SAIs should understand the processes for disaster preparedness and its focuses. They should assess the nature of the risks in each element, familiarise themselves with the internal control applied by all parties responsible for managing disaster preparedness and test whether those internal controls are operating and are sufficient to overcome or reduce the identified risks.

Performance and compliance audits usually involve a choice of audit topics. The first step is deciding what to audit from the myriad of government activities. The audit should be directed towards areas where an external, independent audit may support the oversight function in promoting accountability, economy, efficiency and effectiveness in the use of public resources. The aim is to select audit topics that are significant, auditable and can be expected to lead to important benefits for public finance and administration, the audited entity or the general public.[41]

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[40] ISSAI 3000/89-90

[41] INTOSAI PAS Guideline on Selecting Performance Audit Topics/1.1

The selection of topics should take into account the need to prioritise resources, capcity, budget and time. This involves planning and scoping an audit to help appropriately focus resources on addressing overall risk and to direct auditors in the field work and reporting stages. There are a number of tools that can be used by SAIs to provide input to the selection of topics:[42]

- Area watching

  Area watching entails monitoring key issues in the public sector to keep abreast of developments. Its purpose is to identify possible audit areas for further scrutiny. It is carried out by reading relevant publications and previous reports relating to performance and compliance audits, listening to the experience of regularity auditors, listening to or reading transcripts of parliamentary debates, attending conferences and seminars, discussions with colleagues, stakeholders and specialists, listening to radio and television broadcasts, and reading newspapers and journals.[43] Area watching should be a continuous process that ensures that the SAI is always in possession of updated information about what happens in society and areas that may require further examination.

- Scanning of public sector environment

  Some information such as national budgets and guidelines, related policies, speech from president, SDGs, news/articles from media can be inspected regularly to scan public sector environments that raise public awareness/concern.

- General surveys

  General surveys may cover a whole entity, a group of related activities or particular major projects or programmes of expenditure or receipts. The general survey is aimed at providing an understanding of the organization's objectives, its main activities and the level and nature of resources used in carrying out its functions. Information is assembled and evaluated on the background, objectives, activities, plans, resources, procedures and controls in the entities or areas concerned. Much of the information for general survey work can be obtained through normal day to day work and contact with the public sector organizations.

- Internal discussions and assessments within the SAI

  Internal discussions to debate and assesses the risks associated with possible topics should take place within the SAI.

- Considerations of views of citizens

  The perspective of the citizen that is related to the performance of the audited entity should be taken into account where appropriate. This is because citizens are the source of ideas for performance auditing, a source of demand for performance auditing and users of performance audit reports.

- External stakeholders

  Relationships should be built with external stakeholders and frequent interaction should take place to identify and discuss possible topics. Inputs on topics may be obtained from relevant role players in government, subject experts and the department's internal auditors.

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[42] ISSAI Implementation Handbook – Perfomance Audit. IDI e-Learning course on Implementing Performance Audit ISSAIs

[43] AFROSAI-E PA Manual/3.3.2

Audit topics can also be evaluated against qualitative aspects to determine whether the topics are significant. The following criteria reflected in Table 9 are examples of aspects that may be considered when identifying topics of auditing disaster preparedness.

Table 9. Selection Criteria for Determining Audit Topics

	Criteria	Factors
1	Materiality	Is the topic important to government/the public/the audited entity (national priority) and does it involve a critical area? Is it financially significant to the public exchequer or government program?
2	Public concern	Does the output impact the vulnerability of the target community?
3	Accessibility/auditability	Is the project accessible geographically? Is the data accessible?
4	Possible impact	Will the topic have a powerful impact on reducing vulnerabilities?
5	Improvement	Will the audit lead to improvement in disaster preparedness initiatives?
6	Risk of fraud and corruption	Is there lack of internal controls which compromise the program objective and burden disaster preparedness budget?
7	Timeliness	Is this the right or appropriate time to audit the topic?
8	Other major works planned or in progress	Is other work being planned or done on the topic?
9	Request for audit	Have any special request being made?
10	High political sensitivity	Does the topic involve a delicate subject that is of government concern?

Note: adapted from Module 2, Preparing for Audit of Pre-Disaster Activities, IDI-3I Program, 2015

However, auditing emergency/disaster preparedness is often not the main goal of the audit, but just a part of the audit. For example, while auditing the effectiveness of disaster risk reduction programs, auditing emergency/disaster preparedness-related elements/programs/activities can be just a subtopic covered within the audit. These are several audit reports on the disaster preparedness carried out by SAIs. The topics regarding audit of disaster/emergency preparedness are as follow:

Title	Audit of Disaster Risk Reduction Management on "Disaster Awareness and Preparedness, Information Material and Tools Development and Dissemination" of the Philippine Institute of Volcanology and Seismology (PHIVOLCS)
Country and year	Philippines year 2018
Type of audit	Performance audit using system-and results-oriented approach

Audit objective	To determine whether PHIVOLCS effectively capacitated the key stakeholders through timely distribution of adequate information materials and conduct of seminars/trainings. This main objective was elaborated into two sub–objectives, namely: a. To determine the existence and adequacy of information, education and communication (IEC) policies to ensure proper implementation of the program activities b. To determine whether the conduct of trainings and distribution of information materials to intended participants and recipients were undertaken within the set guidelines and timelines and monitored regularly to determine whether the stakeholders were adequately capacitated.
Audit scope	The audit covered the implementation of the project Disaster Awareness and Preparedness, Information Material and Tools Development and Dissemination covering the calender years 2016 to 2017 in selected areas (Leyte, Cebu, Davao Oriental, Bohol, General Santos City and Zambales) The audit focused on DRR capacity building and DRR communication, two of the four functions of Geologic Disaster Awareness and Preparedness Division (GDAPD).
Audit criteria	PHIVOLCS Strategic Initiative Plan
Methods used	a. File examination b. Interview c. Survey/questionnaire d. Before and after analysis
Findings	a. The established guidelines/procedures for DRR capacity building and DRR communication defined in the QMS need further enhancement through the inclusion of identified processes and standards such as: timelines or duration for each task or process, recommended profiles of preferred attendees in the trainings/seminars, and monitoring and evaluation procedures to ensure that the projects have attained the expected outputs and outcome provided in the PHIVOLCS Strategic Initiative Plan (five-year plan) b. Not all targeted participants were able to attend the seminar-workshops for LGUs and the post training activities undertaken by the participants were not adequately monitored and evaluated to assess the application of the acquired skills or knowledge from seminars attended. c. PHIVOLCS's practice of disseminating information/IEC materials were only upon written request by intended stakeholders, during conduct of trainings/seminars, as part of the seminar kits distributed to participants, and upon request by walk-in stakeholders, which suggests that a limited number of recipients were informed and aware about disaster preparedness and risk reduction. d. PHIVOLCS had satisfactorily capacitated selected key stakeholders in schools and LGUs to engage and conduct DRR initiaves to reduce vulnerability to disasters or limit the adverse impacts of hazards of volcano, earthquake and tsunami

Recommendations	a. Revisit the QMS and consider the inclusion of the following:
	
	    1) The period when each process is to be udertaken and its estimated duration and completion
	
	    2) Procedures on the assessment/monitoring of key stakeholders' subsequent or post training initiatives conducted to carry out/apply the acquired skills learned from the capacity building activities conducted.

b. Specify in the guidelines and invitation letter of PHIVOLCS to Schools Division Superintendent the preferred expertise or specialization of target participants in the training.

c. Include in the memorandum of agreement (MOA) a provision for post training initiative to be conducted by the trained key stakeholders to carry out/apply the acquired skills learned from the capacity building activities conducted down to the communities.

d. Continue to collaborate with other government agencies for continuous development/feedbacks to keep the needs assessment and profile of the stakeholders updated, and their needs appropriately addressed.

e. Continue capacitating key stakeholders through the conduct of additional and/or repeated seminars/trainings in a year, and consider the participation of the youth.

f. Coordinate with the partner agencies together with DND and DILG being the lead agencies of NDRRMC to put in place enforcement mechanism to ensure higher degree of attendance by the target participants of LGUs in the DRRM capacity building and training.

g. Provide specific provisions in the MOA with LGUs/teachers to include:

   1) The commitment to be done by the participants as their means of application of acquired knowledge/skills from the seminars

   2) The preparation and submission by the LGUs/teachers of monitoring reports for the activities they conducted.

h. Based on the monitring reports submitted by key stakeholders, assess the effectiveness of the seminars/trainings conducted.

i. Consider other strategies for mass distribution of information materials that would address its concerns on wastage, non-utilization, and cost effectiveness.

j. Ensure sustainability of the project by collaborating with the LGUs, NGA, NGOs/POs and to look into the several concerns raised by the recipients. For those which cannot be addressed because of budgetary or technological concerns, the agency planners may consider or opt to put them into discussion in their future budget planning.

Title	Performance Audit on Effectiveness of Disaster Risk Reduction (DRR) Programs During 2016 to First Mid 2017 Carried out by National Disaster Management Agency (BNPB) and Related Entities in Jakarta, East Java, West Java, North Sumatera, and South Kalimantan
Country and year	Indonesia year 2018
Type of audit	Performance audit using process-based
Audit objective	To assess the effectiveness of DRR programs during financial year 2016 to first mid 2017 carried out by BNPB and related entities. To achieve the audit objective, the audit assessed whether: a. Regulation and planning of DRR programs have been sufficient b. Implementation and reporting of DRR programs have been sufficient c. Monitoring and evaluation of DRR program have been sufficient
Audit scope	DRR programs/activities carried out by BNPB and related entities during 2016 to first mid 2017 allocated in BNPB's budget.

	This scope is determined based on result of preliminary audit. The scope covers three sub-topics, namely: a. Regulation and planning of DRR programs b. Implementation and reporting of DRR programs c. Monitoring and evaluation of DRR programs
Audit criteria	Better Management Practices covering three main criteria and 28 sub criteria
Methods used	a. Survey b. Document analysis c. Result analysis d. Quantitative analysis e. Field observation f. Confirmation g. Sampling
Findings	Notwithstanding the achievement of BNPB in carrying out DRR program, there are several problems that should be improved, namely: a. Manuals to prepare hazard zones (KRB) and Disaster Management Plan (RPB) had been obsolete and not been up dated. b. There was no information system to monitor the availability of KRB and RPB. c. Manual to prepare contingency plan was insufficient. d. Manuals to prepare risk map and its study, RPB, and contingency plan had been published but they had not been known and understood publicly (i.e. by related stakeholders, internally or externally) e. Standard Operating Procedures (SOP) on disaster data collection system had not been disseminated optimally. f. BNPB had not prepared regulation on termination of emergency status. g. National Disaster Data differed from Local Disaster Data. h. The performance of employee's capacity development could not be measured. i. The development of risk map and risk study was insufficient. j. Some cities/districts set as priority targets for reducing disaster risk index had not developed Local Disaster Management Plan. k. National Plan on Disaster Management 2015 – 2019 developed by BNPB had not been stipulated l. Local disasater data collection systems connected to national disaster data collection system were inconsistent and inaccurate. m. Contingency planning for every hazard type in all priority areas had not been set. n. Mechanism for implementing and reporting of monitoring and evaluation carried out by BNPB had not been supported by sufficient SOP. o. BNPB had not fully monitored and evaluated the achievement of expected targets and goals. p. Results of monitoring and evaluation of DRR programs had not been followed up sufficiently.
Recommendations	BPK recommended Head of BNPB to: a. Instruct Deputy of Prevention and Preparedness and Legal Bureau to revise manuals to develop KRB and RPB, prepare legal protection regarding the

preparation of contingency plan, besides preparing and monitoring mechanism for disseminating DRR to related parties

b. Instruct Head of Center of Information and Data to coordinate with Local Disaster Management Agencies (BPBD) to verify and validate disaster-related data, set annual target for BPBD to maintain the data, and monitor the implementation of verification and validation based on applicable regulation. Head of Center of Information and Data should also coordinate with Legal Bureau to prepare mechanism and disseminate regulation related to disaster collection data system, review the regulation to include sanction for violating the regulation, besides preparing and disseminating SOP on mechanism to verify the data.

c. Prepare and disseminate regulation on mechanism to terminate emergency status to relevant parties

d. Prepare and disseminate SOP on capacity building for BNPB officers, implement policy on annual minimum standard of training hours for relevant officers, and prepare MoU with local government to support DRR programs, especially employee placement and their capacity building

e. Prepare and implement information system on risk map and risk study to support data management of risk map and risk study all over Indonesia, prepare MoU with local government to support DRR programs, and monitor and set target to prepare annual risk map and risk study

f. Instruct Director of DRR to improve oversight on the preparation of KRB for district level; prepare manuals, SOP and guidance on mechanism to prepare KRB and risk map; manage personnel to assist the preparation of KRB in local level; and set mechanism and target of preparation of KRB in each BPBD

g. Develop information system National Disaster Management Plan and local RPB to help maintain RPB data all over Indonesia; prepare MoU with local governments to support DRR programs, especially with regard to preparation and implementation of RPB in local level; set review mechanism; and set target on the preparation and implementation of RPB in local level

h. Improve data collection system by solving problems faced by BPBD.

Title	Focus on the Dutch Contribution to the Reconstruction of Sint Maarten
Country and year	Netherlands year 2018
Type of audit	A focus audit (It is a new type of audit performed by the Netherlands Court of Audit which differs from standard audits in that it has a much shorter lead time – around 14 weeks - focuses on a topical issue and starts out from a precise and clearly defined question)
Audit objective	The audit centers on the following question: What are the consequences of the governance structure for the planning and progress of the chosen reconstruction projects on Sint Maarten funded from the Trust Fund? The central audit question was then subdivided into the following sub-questions: a. What agreements have been made about the way in which the Dutch contribution to the reconstruction of Sint Maarten should be spent? b. Are these agreements observed in practice, and what effects does this have on the planning and progress of the reconstruction effort on Sint Maarten?
Audit scope	The team selected four of the signed commitments which included: a. Repairs to roofs and houses

	b. The restoration of public utilities
	c. Funding a hurricane-proof hospital
	d. The skill and training program
Audit criteria	National Recovery and Resilience Plan
Methods used	a. Literature study and series of interview to answer first sub-question
	b. Detailed research into four specific reconstruction projects on Sint Maarten, document examination, interviews and field visit to answer the second sub-question.
Findings	a. Strategic Results Framework was absent and no consensus has emerged about the clearly measurable objectives that the Trust Fund intended to achieve.
	b. The government of Sint Maarten has neither the capacity nor the expertise that are needed to carry out all the reconstruction projects within the desired time limits.
	c. It is taking longer than expected to get the National Recovery Program Bureau (NRPB) operational. Besides, there is a shortage of experienced project managers, engineers and public procurement officers. The recruitment of experts is proving to be a slow process, with only a small number of cancidates applying for vacancies.
	d. Skill and training program was funded by the Dutch and the World Bank. About 80% of the money went towards income support for participants, while around 20% was spent on program costs. The World Bank took over the funding of the program after it had been in operation for a short while, at which point there was already a clear plan on the table and the SMTF had already organised the logistics. However, the World Bank will be funding the scheme up to the end of Decmber 2019, after which the future is unclear

Title	**Performance Audit on Volcanic Eruption Preparedness During 2015 to First Mid 2016 Developed and Carried out by National Disaster Management Agency (BNPB) and Related Entities in Jakarta, Yogyakarta, Central Java, North Sumatera and North Sulawesi**
Country and year	Indonesia year 2017
Type of audit	Performance audit
Audit objective	To assess the effectiveness of volcanic eruption preparedness activities during 2015 to first mid 2016 developed and carried out by BNPB and related parties.
	To achieve the audit objective, the audit assessed whether:
	a. Management has developed and prepared contingency plans comprehensively
	b. Evacuation route and sites have been available and ready to use
	c. Emergency management and mechanism have been adequately disseminated and trained
	d. Volcanic eruption preparedness have been supported by adequate logistic and utilities management.
Audit scope	Volcanic eruption preparedness of Mount Merapi, Sinabung and Soputan developed and implemented by BNPB and related parties during 2015 to first mid 2016

Audit criteria	Better Management Practices covering four main criteria and 11 sub-criteria
Methods used	a. Interview b. Document analysis c. Result analysis d. Quantitative analysis e. Field observation f. Confirmation g. Sampling
Findings	a. The preparation and formulation of volcanic eruption contingency plan was not fully adequate Some local disaster management agencies (BPBD) in disaster affected areas had not completely prepared and formulated contingency plans. Some contingency plans had not included all necessitated requirements, such as coordination scenario pattern bertween BPBDs in district level to BPBDs in higher level and BNPB, detailed prediction of refugee's needs and available resources. In addition, some existing contingency plans had not been dsseminated and tested. There was also no periodic updating on the existing contingency plans. b. Evacuation sites and routes were not ready to use Some BPBDs in district level had not provided sufficient signposts to assembly meeting point and evacuation sites. Some BPBDs, even, had not determined evacuation sites. Some routes and evacuation sites' facilities are also found broken. The limitation of policy and budget had made evacuation sites and routes inadequate and not ready to use. c. Dissemination and training of emergency response mechanism and management for officials were not adequate The training materials on emergency response mechanism provided by Training Center of BNPB and BPBDs in district and provincial level were not comprehensive. They had not included rapid and accurate assessment on location, damage, loss and resources. Besides, dissemination for public had not been carried out in all affected areas. d. Logistics and utilities planning had not been prepared accordingly BNPB had set a broad logistics and utilities minimum standard, including those for volcanic eruption. However, BNPB found some problems to meet the objectives of the standards. BNPB had also signed MoUs with other relevant entities to fulfil logistics and utilities needs. However, the MoUs had not been equipped with technical agreement on their implementation. Meanwhile, BPBDs in district and provincial level did not have the MoUs indicating coordination planning to fulfil ligistics and utilities to prepare for volcanic eruption. Lack of policy and budget support had made BPBDs unable to meet the standard.
Recommendations	BPK recommended Head of BNPB to: a. Coordinate with Head of BPBDs in Merapi, Sinabung and Soputan affected areas to find an efficient joint financing alternatives to prepare contingency plans and disaster management plans besides stipulating guidelines on preparation of contingency plan and establishing measured parameters to determine disaster scale and level. Those documents should be the reference to prepare contingency plans and to monitor the completion of volcanic eruption contingency plan preparation b. Coordinate with Governor of Central Java, North Sumatera, Special Province of Yogyakarta and North Sulawesi besides Mayor of Klaten, Magelang,

Sleman, Minahasa Selatan and Karo to set final evacuation sites capacity and facility development as priority in disaster preparedness

c. Mandate Head of Training Center of BNPB to coordinate with Director of Disaster Preparedness of BNPB and Head of BPBDs in Merapi, Sinabung and Soputan affected areas to plan adequate training on emergency response mechanism in addition to complete documents on planning and reporting of disaster management training during 2015 to 2016

d. Coordinate with Head of BPBDs in provincial and district level, particularly in Merapi, Sinabung and Soputan affected areas, to establish policies on inventory report of logistics and utilities needed in national, provincial and district level as reference to plan for logistics and utilities fulfilment to prepare for volcanic eruption

e. Coordinate with head of BPBDs in provincial and district level, particularly in Merapi, Sinabung and Soputan affected areas, to prepare MoUs on the logistics and utilities fulfilment and equip them with technical agreement between working units managing logistics and utilities support other than BNPB and BPBDs.

Title	**Audit 1681-GB Participation in the Granting of Support of Those Affected by the Earthquakes of September 7th and 19th, 2017**
Country and year	Mexico year 2017
Findings	The following evidenced that there was not a census and a sufficient and reliable registry to program and prioritize the supports and that it served as a tool for the bank to provide reasonable security in the delivery of resources to the victims, in an efficient, timely and complete manner a. There were flaws in the control mechanisms of the National Savings and Financial Services Bank (BANSEFI - Banco del Ahorro Nacional y Servicios Financieros) due to the fact that it did not give reasonable assurance of the correct programming and delivery of the 6,405,031.5 thousand Mexican pesos of the Natural Disasters Fund (FONDEN – Fondo de Desastres Naturales), delivered to the bank and that would be destined to the reconstruction of homes and that led to risks that the supports were not received in an efficient, timely and complete manner for the beneficiaries as of December 31 of that year since. Although 92.4% (5,917,815.0 thousand pesos) of the amount in 238,311 monetary and housing FONDEN cards had been ministered, this did not mean that the amount and the cards would have been granted to the beneficiary because the cards were active and with resources available before delivery. b. The bank did not have regulations that would empower it and regulate its participation in the delivery of FONDEN's support, which caused irregularities in the coordination with the Agrarian, Territorial and Urban Development Secretariat (SEDATU - Secretaría Desarrollo Agrario, Territorial y Urbano). c. There was lack of control mechanisms to guarantee the totality of the changes instructed by the contracting entity to the censuses and registers of beneficiaries d. There were deficiencies in the administrative model hired by the bank to control the information of the beneficiaries e. There was lack of documentation and control in the integration of bank records f. Failures in compliance with the 12 agreements with the contracting institution, regarding to the validity, number of shares and amount to be dispersed, as well as lack of opportunity in the delivery were identified.

Title	**1681-GB Regulation and supervision of the participation of BANSEFI in the granting of supports to those affected by the earthquakes of September 7th and 19th, 2017**
Country and year	Mexico year 2017
Audit Objective	Provide certainty about the regulation and supervision carried out by the CNBV to BANSEFI, in the delivery of support to the victims of the earthquakes on September 7th and 19th, 2017, as well as to implement improvements to the executed procedures by the bank to comply with the commitments established by the Federal Executive, related to generating agile, efficient and timely interinstitutional coordination mechanisms that allow priority attention in the affected areas, as well as the reconstruction of houses that were damaged by the earthquakes
Findings	a. The regulation and supervision of the National Baking and Stock Commission (CNBV – Comisión Nacional Bancaria y de Valores) to BANSEFI regarding the process of delivery and administration of FONDEN support for reconstruction, presented opportunity problems, since, prior to the earthquakes of September 7th and 19th of 2017, there was no regulation for the allocation of Development Banking for the distribution of support before natural phenomena.
	b. Although the CNBV conducted an investigation into BANSEFI for alleged infractions of banking regulations in the dispersion of FONDEN resources to those affected by the earthquakes of September of that year, it did not instruct the bank in a timely manner to modify its regulatory framework to regulate its performance since 192 calendar days were issued after October 2, date in which it began the administration of resources, and 130 calendar days after his investigation.
	c. In the integration of the files and the lack of approved methodology to identify, measure, monitor, limit, control, inform and disclose the business risk to which it is exposed, the commission did not act in a timely manner since the investigation began once they identified the irregularities in the FONDEN resources management process and that on December 20, 2017, the CNBV issued 20 observations and 4 recommendations, which at the end of that fiscal year were in process.

Title	**Audit of Disaster Management Activities of the Government of Jammu and Kashmir**
Country and year	India year 2016
Type of audit	Performance audit
Audit objectives	The audit was conducted to assess whether among other:
	a. Disaster management structures, institutional arrangement and policies were in place and working effectively
	b. Financial resources were available and were adequate and financial management was efficient and effective for prevention, mitigation, reduction of risk and impact of disaster and intended results were achieved
	c. Comprehensive risk assessment was conducted to identify the nature, location, intensity and likelihood of major hazards and preparedness to deal with disasters in the future was undertaken

Audit scope	Disaster Management Activities covering period from 2010-2011 to 2014-2015 including the drought of 2009, the cloudburst in Leh of 2010 and the flood of September 2014
Audit criteria	Disaster Management Act 2005
Methods used	Test-check of records of the two Commissioner Secretaries, two Divisional Commissioners (Kashmir and Jammu), seven Deputy Commissioners and other line departments of the districts covering the period between 2010-2011 and 2014-2015.
Findings	a. The State Disaster Management Agency (SDMA), though established in April 2007, was not fully constituted as its full time members were yet to be appointed (July 2016).
	b. The SDMA met only once (February 2012) during 2010-2015 when State Disaster Management Policy (SDMP) was approved
	c. The SDMP though approved (February 2012) by the SDMA, had not been impemented fully.
	d. The State Advisory Committee had not been constituted as of October 2015.
	e. National plan and State plan had not been implemented. Guidelines for preparation of disaster management plan by departments were also not laid down.
	f. Divisional Disaster Management Authorities had not been established as of April 2016.
	g. Districts Disaster Management Authorities though constituted, were non-functional. District Disaster Management Plans had not been formulated in the six test-checked districts.
	h. The approved District Disaster Management Plan of Leh District had neither been implemented nor reviewed.
	i. The State Disaster Response Force was significantly short of its sanctioned strength. Besides, the bulk of the available manpower was neither fully trained nor deployed for disaster relief and rehabilitation thereby defeating the objective of the creation of the Force.
	j. No hazard and disaster risk map of the State had been prepared though an amount of fund had been released (June 2014) under capacity building for this purpose. Besides, data related to nature, location, intensity and likelihood of possible major hazards and population and assets at risk are not available with the State Government. Consequently, realistic and informed strategies and action plans for disaster risk reduction could not be formulated.
	k. Fund was utilized for purposes not related to the flood spill channel and some flood spill channel was not treated and excavated respectively.
	l. Earthquake-resistant designs had not been mandatory for private buildings. Further, disaster resistant designs and retrofitting techniques had not been ensured in reconstruction of houses which were fully or severely damaged during the floods of September 2014 and for which relief was provided by the Government. Hence, the constructions remained vulnerable to earthquakes in a seismic sensitive zone.
	m. The mechanism for early warning systems had not been established and fund was surrendered.
	n. Some fund for capacity building and public awareness for managing disasters was surrendered.
	o. The State Government had not undertaken capacity building activities including public awareness and preparedness as envisaged. Further, some fund was utilized for procurement of vehicles instead of capacity building.

Recommendations	a. Establish and operationalize the institutional structures and disaster related policies envisaged in the Disaster Management Act 2005 for efficient and effective management of pre and post disaster activities.
	b. Conduct vulnerability, hazard and risk assessment especially in the 13 multi hazard districts and prepare risk maps that would enable formulation of informed strategies and prioritization of resources for disaster preparedness including an early warning system.
	c. Ensure the personnel of the State Disaster Response Force undergo the mandatory trainings in a time bound manner and thet they are thereafter used solely for the intended purpose.
	d. Formulate and implement a time bound plan for capacity building including promotion of general awareness and community training and building capacity to combat disasters as an important pre-disaster activity.

Title	**2013 Public Account**
Country and year	Mexico year 2013
Findings	**Finding of Audit 127-GB Civil Protection**
	a. The National Center for Disaster Prevention (CENAPRED – Centro Nacional de Prevención de Desastres) carried out research, training, dissemination and monitoring actions to generate information that allows the prevention of hazards, risks and damages caused by disrupting agents that could lead to disasters. However, it lacked records and documentary evidence that would allow its contribution to the reduction of the vulnerability of the population and its environment in the presence of disturbing phenomena.
	Finding of Audit 129-GB Civil Protection
	a. The National Water Comission (CONAGUA – Comisión Nacional del Agua) took the necessary actions to generate the information that allows detecting and identifying the hydro meteorological phenomena that disturbs the security of the population and its environment, thereby participating in the public policy of civil protection, but it is not possible to determine the impact of CONAGUA's actions in reducing the vulnerability of people and the protection of their physical and patrimonial integrity.
	Finding of Audit 133-GB Civil Protection
	a. The Secretariat of State (SEGOB – Secretaría de Gobernación) coordinated the operation of the National Civil Protection System since it participated in the identification of foreseeable risks; in the attention of incidents caused by natural and anthropogenic phenomena, and in the authorization of declarations of emergency and disaster, by inducing and promoting civil protection programs, for which it contributed to the consolidation of the National System of Civil Protection through the Integral Risk Management and, consequently, collaborated in the safeguard of the physical and patrimonial integrity of people in situations of disasters of natural or human origin.
	The actions issued by the SAI of Mexico will allow SEGOB to generate the necessary mechanisms to ensure that the authorities responsible for implementing the public policy of civil protection have timely knowledge of the warning of disturbing phenomena. It will have the universe of internal programs of civil protection in the Federal Public Administration, as well as the objectives and goals to measure its performance in the actions of forecasting, prevention, care and reconstruction in the field of civil protection and its contribution to strengthening the resilience of society in the face of disturbing phenomena.

Title	**The Accounts Committee for Control over Execution of the Republican Budget of the Republic of Kazakhstan - included EUROSAI Joint Report on the International Coordinated Audit (Control) of Public Funds, Allocated to Prevention and Consequences Elimination of Disasters and Catastrophes**
Country and year	Kazakhstan year 2010 – 2011 and 1st half of 2012
Audit subjects	Control of utilization efficiency of the republican budget, allocated to the Ministry of Emergencies of the Republic of Kazakhstan (hereinafter – the Ministry), its subordinated institutions and organizations, evaluation of the Strategic Plan of the Ministry for 2011–2015, as well as implementation of the republican budgetary programs.
Audit object	The Ministry of Emergencies of the Republic of Kazakhstan, the Regional Department of Emergency Situations of the Ministry (hereinafter – DES), the Firefighting and Rescue Services of DES in Akmola Region, Almaty and Astana cities, the State Institution "Kokshetau Technical Institute", the State Institution "Kazselezaschita", JSC "Kazaviaspas", JSC "Orth Səndirushi", the Republican State Budget-Supported Enterprise "Seldenkorgau Kurylys".
Audit objective	Control of utilization efficiency of the republican budget, allocated to the Ministry of Emergencies of the Republic of Kazakhstan, its subordinated institutions and organizations, evaluation of the Strategic Plan of the Ministry for 2011–2015, as well as implementation of the republican budgetary programs.
Findings	a. The budgetary legislation terms for amendments of the Strategic Plan of the Ministry exceeded admissible, the methodical instructions on development indicators had not been followed, 8 republican budgetary programs, out of 16 analyzed, were not fixed with the objectives of the Strategic Plan, some of them had duplicated indexes. All these indicated a low level of elaboration of the indicators and values of the Strategic Plan for 2011 – 2015 years by the Ministry. b. The monitoring and warning system on the emergencies threat in Kazakhstan did not in a due measure meet modern requirements. There was a shortage of equipment for monitoring of dangerous processes. The reliable channels of data, research and information centers capable operatively to accept administrative decisions on liquidation of threats and consequences of emergencies were absent.
Recommendations	The Ministry of Emergencies of the Republic of Kazakhstan was recommended to take comprehensive measures on: a. improvement quality of the budgetary planning through establishment of reasonable amount of funds for a complete, high-quality and timely implementation of the planned activities of the republican budgetary programs b. enhancing role and efficiency of the internal control in terms of ensuring preventive control in planning and financing of the budgetary programs and policy documents, implementation of the risk management system that meets modern requirements, as well as strengthening control over quality of the state asset management in the subordinated organizations.

Title	**The Audit on Utilization of Funds, Allocated to Prevention and Consequences Elimination of Disasters in Republic of Azerbaijan - included EUROSAI Joint Report on the International Coordinated Audit (Control) of Public Funds, Allocated to Prevention and Consequences Elimination of Disasters and Catastrophes**

Country and year	Azerbaijan year 2010 – 2011
Audit subjects	a. Activities of the executive bodies related to natural disasters b. Resources allocated to prevention and consequences elimination of natural disasters c. Documents related to the audit subject.
Audit object	Institutions, which are responsible for the management system on disaster preparedness and their consequences elimination, namely: the Ministry of Emergency Situations of the Republic of Azerbaijan and its subdivisions, the Melioration and Water Management OJSC, the Ministry of Ecology and Natural Resources of Azerbaijan Republic.
Audit objective	Analysis of the state of readiness of the Azerbaijan Republic to natural disasters and utilization of the resources allocated to their consequences elimination.
Recommendations	a. While planning budgetary resources for disaster preparedness and prevention their consequences,it is required to increase opportunities for participation of the relevant organizations b. While planning resources for prevention and consequences elimination of natural disasters, it is required to consider results of the analysis and practice, obtained in discussions and by analyses of the occurred natural disasters. c. In order to prevent and respond to natural disasters in the territories with a high probability of floods, earthquakes, landslides, mudslides, etc., it is required more actively engage the professional organizations and scientists on study technical parameters of dams, dykes, bank protection and other related works. d. In order to improve disaster preparedness, practical exercises should cover more territories and different populations. e. The number of organized special courses related to disaster preparedness and prevention their consequences, should be increased at secondary, specialized secondary schools and higher educational institutions. f. It is considered necessary to disclose to the general public works carried out at the expense of funds allocated to disaster elimination. g. It is reasonable to increase resources allocated to appropriate training by monitoring and classification of the disaster risk territories.

Title	International Coordinated Audit of Utilization Budgetary Resources, Allocated to Prevention and Elimination of Disasters in 2010 – 2011 - included EUROSAI Joint Report on the International Coordinated Audit (Control) of Public Funds, Allocated to Prevention and Consequences Elimination of Disasters and Catastrophes
Country and year	Russian Federation year 2010 - 2011
Audit subject	a. Legal regulation in the field of prevention and consequences elimination of disasters, including interdepartmental and intradepartmental legal documents, which regulate issues of interaction between the government bodies, including attraction and utilization of the financial and material resources for the purposes of prevention, preparedness, response and consequences elimination of disasters b. Financial and material resources, allocated to prevention and consequences elimination of disasters, including those allocated to the target programs in the

	area of prevention and consequences elimination of natural and mancaused disasters
	c. Activities of the government bodies in the field of financial and logistical support for disaster prevention, preparedness, emergency response to disasters and their consequences elimination.
Audit objects	The national audit covered 3 objects, including:
	a. Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters36
	b. Regional Office of the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters in Krasnodar region
	c. Regional Office of the Ministry of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters in Vladimir region.
Audit objectives	a. To determine sufficiency of the regulatory framework in the field of prevention and consequences elimination of disasters, including interdepartmental and intradepartmental legal documents, which regulate issues of interaction between the government bodies, including attraction and utilization of the financial and material resources for the purposes of prevention, preparedness, response and consequences elimination of disasters
	b. To determine utilization efficiency of the budgetary resources, allocated to establishment and operation of the warning system, maintenance readiness of the government bodies, forces and resources, emergency response to disasters and their consequences elimination
	c. To determine effectiveness of the state system for prevention and response to natural and mancaused disasters.
Findings	a. The Russian Federation legislative and regulatory framework in the field of protection population and territories from emergencies were availabe to determine the main directions of the state policy in this area and was quite complete.
	b. The total amount of RUB 325.5 billion (about USD 9.8 billion) in 2010 and RUB 403.7 billion (about USD 12.3 billion) in 2011 were allocated to establishment and operation of the warning system, maintenance readiness of the government bodies, forces and resources, emergency response to disasters and their consequences elimination, that allowed to ensure further improvement of protection system of the population and territories from natural and man-caused disasters.
	c. Created Unified State System for Prevention and Elimination of Emergencies allowed to begin transformation to the disaster risk management on the basis of new information technologies and more than 2.5 times increase efficiency and effectiveness of the emergency response
	d. Regional warning systems provide notification of 86.9 % of the population.
Recommendations	Based on the results of the national audit, the Representation of the Accounts Chamber of the Russian Federation was addressed to the Minister of the Russian Federation for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters, in which it was proposed to make adjustments of the ministerial regulatory documents, and to take measures on increasing effectiveness of utilization of the federal funds and effectiveness of financial management.

Title	**The Audit of Warning and Prevention Systems of Disasters and Their Consequences Eimination - included EUROSAI Joint Report on the International**

	Coordinated Audit (Control) of Public Funds, Allocated to Prevention and Consequences Elimination of Disasters and Catastrophes
Country and year	Hungary year 2009 - 2010
Audit subject	The budgetary resources, allocated to prevention and consequences elimination of disasters and catastrophes
Audit objective	The main objective of the audit was to investigate and assess achieved level of cooperation between central and local authorities, contribution of the nongovernmental organizations to protection against natural disasters, the subsequent rehabilitation works, as well as utilization of the budgetary resources, allocated to disasters prevention and preparation
Findings	a. Significant inconsistencies in the legal and regulatory framework related to natural disasters existed. The laws contain conflicting provisions, inconsistent terminology and requirements, causing duplication of authorities and jurisdictions.
	b. The system of flood protection in Hungary is well equipped, even in accordance with the European standards. The water management services are characterized with a high professionalism.
	c. The legislation of Hungary on disaster management has not still been adapted to the rules of the international disaster-related aid from NATO and the EU. Adaptation of these provisions is a condition for giving and receiving of the international disaster-related aid and also provides a rapid response of NATO and the EU.
	d. Decrease of activities effectiveness is caused with decrease of allocations for the disaster management.
	e. The number of staff of the National General Directorate on Management in the Field of Catastrophes did not meet requirements that caused difficulties in performance its key responsibilities.
	f. The normative and institutional disaster management system did not provide full preparation for the effective disaster management and successful actions of the local authorities in disaster prevention.
	g. The legal framework did not ensure compliance between duties and jurisdiction of the local authorities to logistical, operational, technical and financial resources, required for their implementation.
	h. Tasks of the local authorities related to disaster management exceeded their capacities in terms of staff.
	i. Professional training of the local authorities was insufficient. Legally defined authorities and duties of the mayors are not ensured with the required conditions for their implementation.
	j. The meteorological warning system has ensured timely provision of information about expected weather conditions, which cause damages. However, majority of the local authorities are not able to use this information efficiently, as far as they do not possess special skills that confirm need for professional instruction.
Recommendations	SAI of Hungary recommended to the Government:
	a. to ensure adoption of the regulations with a unified terminology
	b. to eliminate gaps and duplications in the existing legislation with regard to activities and funding
	c. to revise responsibilities and authorities in disaster management, delegated to the local authorities, as well as the issue of providing them with the resources, required to perform these responsibilities and authorities

	d. to adapt the regulatory framework with the rules and regulations applicable in the EU and NATO, which will allow to ensure communications with the monitoring and information centers, quick response of NATO and the EU, as well as to create conditions for providing and receiving international disaster-related aid
	e. to consider possibility of regulatory definition of principles for attraction charitable organizations to the process of preparation to disasters and their consequences elimination.

Title	**Adaptation Measures for Climate Change Scenarios in the Brazilian Semiarid Region Regarding Water Security**
Country and year	Brazil year 2008
Type of audit	Performance audit
Audit objective	To assess to what extent governmental actions regarding water security in the Brazilian semiarid region take into account climate change scenarios
Audit scope	Assessment by governmental institutions on vulnerabilities, impacts, and risks for the water security of the Brazilian semiarid region; government public policies or similar actions to guarantee water security in the semiarid region, in response to possible effects of climate change; preparedness of public institutions responsible for water resource management in the states of the semiarid region to incorporate the guidelines pointed out by the federal government to adapt to climate change effects
Findings	a. There was no climate change risk assessment for the semiarid region produced by the government.
	b. Development policies related to water management and distribution did not yet taking into account potential effects of climate change.
	c. Studies conducted by the government that propose guidelines for the implementation of polices for the water sector did not consider climate change impacts.
Recommendations	a. The institutions responsible for the implementation of the National Plan on Climate Change promote institutional and political coordination between the different sectors of the federal government in order to produce a national climate change risk assessment and to encourage technical research development of climate change impacts on the Brazilian semiarid water resources.
	b. The institution responsible for the implementation of environmental policies adopt measures to install the Alert System of Drought and Desertification to foster the development of climate change scenario modelling for the Brazilian semiarid region and to encourage the responsible institutions to plan and implement water resources policies that consider potential climate change impacts.

Title	**Audit of the Fulfilment of SIP for the Transformation of the Shelter Object into an Environmentally Safe System - included in the Coordinated Audit of Chernobyl Shelter Fund**
Country and year	Ukraine year 2007 - 2008

Audit objective	To establish actual state of affairs regarding legal, organizational and financial support of decommissioning ChNPP and transforming destroyed CNPP Unit 4 into an environmentally safe system by fulfilling SIP approved by the Government of G-7 countries and Ukraine, as well as regarding utilizing the funds from the State Budget of Ukraine, CSF, NSA, EC and international technical assisstance of USA and Canada
Findings	a. The Accounting Chamber of Ukraine assessed positively the state of affairs regarding legal and organizational support while decommissioning ChNPP and transforming destroyed CNPP Unit 4 into an environmentally safe system as a whole.
	b. Accounting Chamber of Ukraine assessed positively the state of affairs regarding financial support while decommissioning ChNPP and transforming destroyed Unit 4 into an environmentally safe system provided by international assistance funds and the State Budget of Ukraine.
	c. The Accounting Chamber of Ukraine stated about a low level of the fulfilment of SIP approved by the Governments of G-7 countries and Ukraine.
	d. Several important facilities within the SIP framework were not yet completed.
	e. The Accounting Chamber of Ukraine stated that system for managing international technical assistance allocated through EBRD to decommissioning ChNPP and transforming its Unit 4 into an environmentally safe system did not provide efficient and transparent utilization of the funds of both international technical assistance and of the State Budget of Ukraine as Ukraine's contribution to CSF. SAI of Ukraine insisted on taking urgent measures regarding a change of the situation in SSE ChNPP.
	f. Based on audit findings, the Accounting Chamber of Ukraine assessed activities of EBRD managing CSF as not open and transparent enough.

CHAPTER 4
CONCLUSION

Emergencies/disasters and other crises are no respecters of national borders and never occur at convenient times. Located in an area that is susceptible to a variety of potential disasters has made preparing for disasters and having pre-planned policies to coordinate a strategic response is not only important for government agencies, but also for local residents and businesses. Preparedness ensures that government agencies, residents, and businesses have the necessary equipment and resources to stay safe during a disaster and to survive without regular services during the following phase of recovery. That is why it is so important to put into planning and preparation long before the disaster strikes.

At national and global level, emergencies/disasters/crises involve mostly the same partners, pose the same managerial and political challenges and ultimately require the same overall coordination approach and response mechanism. Effective disaster preparedness helps alleviate some of the chaos brought by the unexpected crisis. And, thus, it is critical to have key elements of emergency/disaster preparedness (i.e. risk assessment, planning, training and exercise, organise and equip, early warning system and information system, and public education) implemented as a continuous process and inevitable aspect of preparedness phase. It is also important to have a written plan in place and for all relevant parties to understand their role within the plan. Contingency plans should also be revisited regularly to ensure complete understanding within the organization.

Having a robust emergency preparedness system in place is more cost effective than heavily rely on the respond of the later phases of the management cycle (even if government management is good when managing the situation of emergency and rehabilitation). It is not only about cost effectiveness, but also about saving people lives. With this argument, auditors play very crucial role to evaluate whether the government already has a robust emergency preparedness system in place, that is effective to reduce the disaster risk. INTOSAI has published ISSAI 5500 series. However, the current ISSAIs have not discussed about the audit of government readiness for emergency situation, meanwhile this issue is very important due to the big risk of losing lives either because of the disaster itself or because of the chaotic situation in emergency situation.

The goal of emergency/disaster preparedness audit is to increase the impact of the audits and to improve the emergency/disaster preparedness of the relevant parties. There are many factors that can influence the extent to which an audit has an impact. Some of these are are within the control of the audit office; for example, the selection of the audit topic, the timeliness of the report, and the nature of the recommendations made. Other factors are perhaps beyond the control of the office, including for example, pressure from the media and parliamentarians as well as the willingness of audited entities to make changes. Base on the examples of audit findings from several SAIs showed that there are some deficiencies or weakness in disaster management activities even in predisaster, emergency or postdisaster phase. SAIs with their mandate proposed recommendations to solve the problems. However, follow up from the audit entities not yet fully met with the recommendations.

Choosing audit topics relies on acquiring a solid "knowledge of business" and exercising professional judgment in assessing risk and significance. The key point in all of these is that it is possible to increase the impact of emergency/disaster preparedness audits by tackling the underlying the problems behind them. Undertaking a root cause analaysis during examination of the audit is the foundation for strong recommendations. Relevant and updated audit standard or guide in audit of disaster management is

needed. Thus, all emergency/disaster preparedness audits need to be followed up to determine progress in resolving deficiencies and implementing recommendations as it is always an important means of ensuring sustainable impacts.