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An Emergency Management Doctrine and Philosophy: The Five Dimensions

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Emergency Management has not developed in a cohesive or comprehensive manner. Differing terms are used to name identical concepts. A standard comprehensive doctrine for the important development of emergency management is needed. In this paper I explain a doctrinal framework for emergency management. The paper states a clear identification of the five dimensions, and each of their components, necessary to the informed practice of Emergency Management. Although emergencies vary in cause and severity, the process of Emergency Management necessary for optimal handling of these emergencies varies little. The “All Hazards Approach” to emergency management establishes and reinforces commonality in processes, procedures, planning templates and organizational structure. The three types of agencies associated with emergency management activities are discussed, including the subject matter agency, coordinating agency, and supporting agency. The four critical functions of emergency management are detailed, and include mitigation, preparedness, response, and recovery, often all carried out concurrently. The ten activities, and seven resources of emergency management are highlighted. There are many ways to represent the integration of these five dimensions, to ensure completeness, while ensuring clarity; the two most common are described. When experts in Emergency Management follow the doctrine, they can coordinate all those involved to be sure that all aspects of any hazard are considered, and that all organizations/agencies, functions, activities, and resources of Emergency Management are coordinated and optimally active. Following this process is the only way to ensure the best outcomes from any emergency.

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Emergency Management has been a concept since earliest man. The need to avoid or deal with hazards began with individual actions and then coordinated group actions. Since September 11, 2001, governments and organizations in North America have taken a renewed and more in-depth interest in this discipline.[1,2] That said, Emergency Management has not developed in a cohesive or comprehensive manner. Differing terms are used to name identical concepts. A standard comprehensive doctrine for the important development of emergency management is needed.

In simplest terms doctrine is a body of principles in a branch of knowledge. It is a description of "what" is required. The how is then developed in Legislation, Policy, and Procedures.

In this paper I explain a doctrinal framework for emergency management. The paper states a clear identification of the five dimensions, and each of their components, necessary to the informed practice of Emergency Management. Although emergencies vary in cause and severity, the process of Emergency Management necessary for optimal handling of these emergencies varies little. The information here has been used to train and advise experts in Emergency Management during my career. It is my hope that the information can also be used by non-experts in order to understand the importance of the process required for optimal Emergency Management.

1. The Aim of Emergency Management

The aim of emergency management is to continuously protect people, property/resources and the environment from evolving natural and human induced hazards.

The order of priority for protection is normally as stated above, first people, then property and resources and finally the environment. There are times when the environment will be placed as more important than existing property/resources, but in those cases a clear statement will be made to that effect by the responsible authorities.

2. The Dimensions of Emergency Management

Emergency management is made up of five dimensions. Each of these dimensions represent a critical aspect of an entire process and each are linked. Many people try to represent this discipline in two or three dimensions, and in so doing either confuse the process or worse miss aspects. In simplest terms, the five dimensions are:

- Hazards/Risks
- Groupings/Organizations
- Functions
- Activities
- Resources

In the sections that follow, each of these five dimensions will be described. They will then be integrated to show how they must be linked to ensure completeness as well as seamlessness.

2.1 The First Dimension - All Hazards Approach to Emergency Management

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The "All Hazards Approach" to emergency management establishes and reinforces commonality in processes, procedures, planning templates and organizational structure.[1] This is extremely important, as it reduces the reaction and training time required to respond to major emergencies and disaster. It permits large groups of responders who do not normally work together, to integrate their response in a minimum amount of time. In general terms, hazards are phenomena that produce negative effects on life and can be categorized into natural and human-induced. The function of mitigation distinctly separates natural hazards from human-induced hazards. It is normally possible to mitigate against both the root cause and the effects of Human-induced hazards. Conversely, for natural hazards the root cause cannot normally be mitigated (i.e. stopping an earthquake or hurricane before it happens), while the effects may be mitigated against.

2.1.1 Natural Hazards are events in the physical environment that are destructive to human life and property. These phenomena are found in or created by naturally occurring conditions and include meteorological, hydrological, geological, and biological events.

Geological. These events are related to or based on geology and include changes to geological formations and the results of geologic forces that lead to earthquakes, tsunamis, subsidence, landslides, and volcanic activity.

Meteorological. These events pertain to atmospheric phenomena, especially weather and weather conditions and include all forms of precipitation, tornadoes, hurricanes, as well as their resulting flooding, ice jams, dam breach, and avalanche.

Biological. These events pertain to all living organisms in our ecosystem and include such things as human, animal, and plant disease, infestations, and microbial outbreaks.

2.1.2 Human-induced Hazards are categorized as those disasters or **emergency** situations where the direct cause(s) are identifiable human actions, deliberate or otherwise. The hazards are therefore further classified as either non-intentional or intentional.

Non-Intentional. Non-intentional events/incidents are those related to human-error and system failure. It covers the full range of technological failure that may affect industry and manufacturing.

Intentional. Intentional events/incidents are those deliberate acts that are planned, prepared, and executed with conscious design or purpose. Intentional hazards include, Employee unrest, Civil unrest, Terrorism, International Tension, Criminal Acts, or War

2.2 The Second Dimension - Emergency Management Groupings/Organizations/ Agencies

During an actual emergency, the emergency management framework normally takes a bottom-up approach to activities and considers all organizations, agencies and jurisdictions involved in a potential response or recovery. Therefore, it is very important that the three major types of agencies be understood and linked prior to the emergency in the pre-event functions of mitigation and preparedness.

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2.2.1 Three types of Agencies. The three types of agencies associated with emergency management activities are:

Subject Matter Agency. The Subject Matter Agency is, generally, hazard specific and usually assigned by legislation, regulation, policy or a plan to lead in the emergency management of a specific hazard. In evolving events or disasters there may be multiple or changing Subject Matter Agencies. An example of this may involve an infectious disease in animals with the capacity to cross to humans. Animal Health Agencies would be the Subject Matter Agency; however, the situation may dictate that Human Health Agencies would share or lead in the response. Coordination in an instance such as this would be vital to ensure to the effective prioritization of response activities and distribution of critical resources.

Coordinating Agency. The Coordinating Agency remains the same regardless of the hazard and provides a consistent foundation from which emergency management can be coordinated. The Coordinating Agency is assigned by legislation, regulation, policy or a plan to coordinate the efforts of different orders of government, supporting/logistic agencies and other emergency management partners to coordinate requests from the lead agency to deal with the direct effects of the specific hazard, while dealing with the indirect results of the specific hazard. There should be only one Coordinating Agency at each order of government, i.e., one per municipality, one per provincial/state government and one per federal government.

Supporting Agency. Supporting Agencies are those organization(s) assigned by legislation, regulation, policy or a plan to assist the Subject Matter and Coordinating Agency in the emergency management of a specific hazard. While there may only be one Subject Matter Agency, there will be a number of supporting agencies that bring into the fold crucial capabilities and resources that are not integral or normally available to the Subject Matter Agency.

2.2.2 Emergency management groupings/organizations. The three types of agencies then can be applied across the full spectrum of emergency management personnel and organizations. These groupings/organizations work bottom up in a normal response, regardless of hazard. They are broken normally into the stepped structure below:

Citizens. It is up to every citizen to know what to do in an emergency. While education and awareness programs rest with government, the expectation is that citizens will take the time to plan and prepare. In Canada, emergency management organizations expect that the citizens that are indirectly impacted by an emergency or disaster will be prepared for the first 72 hours. This preparedness is expected to reduce the burden on the First Responders and Municipal Order of government in response to an emergency or disaster.

First Responders. First Responders are the local officials (from both the public and private sectors) that come to the aid of citizens that are directly impacted by an emergency or disaster. They include as fire departments, police and emergency medical services. If the First Responders need assistance, they request it from the municipality (local authority). Additional tactical response resources from other government agencies, industry or non-government agencies, may also be made available as coordinated with the municipality or local authority.

Municipal Government. The municipality is the first order of government that is

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directly involved with response. Depending on the jurisdiction they may be fully empowered legally in time of emergency or may simply be the owner of the First Response agencies. Their knowledge of the impacted community and its citizens can be key to a successful emergency management program. Depending on the size of the municipality, the community may lack critical assets to respond fully to local emergencies. Mutual aid partnerships with bordering communities will normally permit these shortfalls to be addressed, as well as to provide redundancy in essential areas.

Regional Government Agencies. In some jurisdictions, regional government agencies may have a legislated role in major emergencies or disasters. These may be regional government bodies or county/municipal district bodies. These organizations may help limit the span of control for provincial/Territorial/State emergency management agencies in times of widespread disasters, such as a pandemic influenza outbreak. Mutual Aid may also be preplanned between this order of government organization.

Provincial/Territorial/State Government. This order of government usually has an extensive legislated responsibility for emergency management. Provincial/Territorial/State governments normally have full jurisdiction over Public Welfare and Public Order emergencies that occur in their areas, unless specifically assigned to the federal order of government. Provincial/Territorial/State government departments and agencies will also support the regions and/or municipalities as requested. Every province/territory/state has an Emergency Management Organization (EMO), which is normally the designated provincial Coordinating Agency. EMOs, with the designated Subject Matter and supporting agencies, coordinate assistance and support to regional, municipal and/or community emergency management organizations.

Federal Government. This order of government is the final authority for all emergency management within a sovereign nation. The elected government is accountable to the public for Public Welfare and Public Order emergencies, which are past the capability of the provincial/territorial/state order of government and are also responsible for emergency management of international tensions and emergencies caused by war. Federal departments and agencies support the provincial/territorial/state emergency management organizations as requested or can also be legislated to act as the Subject Matter Agency for specific hazards (i.e., CFIA for specific animal health diseases). Requests from the provinces/territories/states to the federal government are normally managed through the federal Coordinating Agency (I.E. Public Safety and Emergency Preparedness Canada (PSEPC), Department of Homeland Security (DHS).

Non-Government Organizations (NGO). NGOs are private organizations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development. They may include any non-profit organization, which is independent from government. NGOs are typically value-based organizations, which depend, in whole or in part, on charitable donations and voluntary service. Although the NGO sector has become increasingly professionalized over the last two decades, principles of altruism and voluntarism remain key defining characteristics.

The Private Sector. Our economy and day-to-day lives can be bundled into numerous sectors, such as health, energy, agriculture, transportation, and environment**,** to name a few, that are ‘stove-piped’ and function, for all intents and purposes, in

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isolation from other sectors. Therefore, an extremely important partner to government organizations for emergency management is the private sector. Each section of the private sector is normally regulated to perform certain emergency management activities by their governmental regulatory body. This regulatory body is the Subject Matter agency for government, for hazard(s) caused or which may result from the private sector industry. In an interface event, regardless of hazard, a governmental subject-matter agency is usually defined through legislation, regulation, or policy as the lead, to coordinate the actions of both the public and private sector.

2.3 The Third Dimension - Emergency Management Functions

In emergency management there are four critical functions that take place on a day-to-day basis regardless of the situation: mitigation, preparedness, response, and recovery.[1,3] These functions are sometimes referred to as the four phases of emergency management. They are referred to as functions because they include distinct actions and activities that occur in the continuum of emergency management; they can be conducted concurrently regardless of the event or incident.

2.3.1 Mitigation. Mitigation should be the cornerstone of emergency management. It's the ongoing effort to lessen the impact disasters have on people's lives, property/resources, and the environment. Mitigation includes all actions taken to attempt to maintain a normal state of life by removing/minimizing the items at risk from the effects of hazard(s); or by reducing the effects of the hazard(s) on the items at risk, with an aim to prevent or reduce a disaster impact when it occurs. In simplest terms, mitigation is an ongoing process that seeks to separate the threat from potential target(s) or to separate the target(s) from the potential threat.

Therefore, mitigation starts with an identification of hazard(s), a risk analysis for the hazard(s) and then includes all actions designed to prevent, protect, or remove the impact of that hazard.

Examples of mitigation include the building of fireguards, river dikes, the use of security measures, public alerting/warning systems, actions to ensure hardening, redundancy and speed of repair of essential systems and legislating building codes.

2.3.2 Preparedness. Recognizing that perfect mitigation is impossible, preparedness includes all actions that are focused on building capability to respond effectively and rapidly, when items at risk are about to be or are affected by hazards. Preparedness includes the education, planning, and exercising necessary to achieve a state of readiness for incidents, disasters, and major emergencies. Examples of preparedness include the preparation and maintenance of plans, the conduct of simulation exercises, and the maintenance of equipment stockpiles.

2.3.3 Response. Response is the execution of the capability to minimize the losses to items at risk when they are affected by hazards. The primary emphasis and immediate actions of response is to prevent injury and loss of life, protect property/critical resources, and meet basic human needs. Response includes all action taken to address the immediate and short-term effects of an emergency or disaster, including the immediate effects on the environment.

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2.3.4 Recovery. Recovery is the returning of the effected organization/group to a state of normal life, after it has been affected by a hazard. Recovery commences as soon as possible and can occur concurrent to Response function. Recovery may include actions traditionally associated with providing disaster recovery assistance and/or individual and public assistance programs through disaster social services. Recovery also includes the re-establishment of the economy of the affected region/area/sector of the economy.

2.4 The Fourth Dimension - The Ten Activities of Emergency Management

Within emergency management there are ten activities that must be considered to guarantee success. These activities form the fourth dimension of emergency management. The activities are inherent in all organizational structures, but in turn do not dictate an organizational template. These activities are not exclusive to emergency management. In fact, they represent the ten activities required to complete a large complex program or project.

Some jurisdictions refer to these ten activities as the Incident Command System. The Incident Command System (ICS) provides a tactical emergency management template that dictates an organizational structure based on Command (Governance), Planning, Operations, Logistics, and Finance/Administration.[3] In larger organizations ICS is restrictive and does not identify the balance of activities that must be considered. The full list includes Governance, Operations, Plans, Intelligence, Logistics, Private/Public Sector Coordination, Finance, Administration, Communications, and Training. Understanding the emergency management activities will enhance communications, cooperation, and coordination without the requirement for transitional changes in organization to deal with response. The identification of organizational elements responsible for each activity will enable diverse organizations to communicate without having to adopt a common organizational structure.

A complete break out of these ten activities is as follows:

2.4.1 Governance

Governance is the act of affecting leadership and monitoring (through policy or procedure) the strategy and direction of an organization. In general, governance comprises the traditions, institutions and processes that determine how power is exercised, how citizens/individuals are given a voice, and how decisions are made on issues of public concern. It can include such things as legislation, policy, specific approval procedures, program management, and project management.

2.4.2 Operations

Operations is that activity/grouping of an organization which carries out the actual execution of the core operating functions. Having received the intent and tasks from Governance, Operators coordinate and execute existing and new plans. On behalf of Governance, the Operators control and prioritize personnel, resources, and activities. Operations includes all activities associated with the daily control and conduct of routine business, activities to ensure business continuity and activities to mitigate against, prepare for, respond to, and recover from all hazards. It also includes the establishment and continued operation of liaison with other operational agencies which have an interest or a role in the current activities of the organization in question.

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2.4.3 Planning

Planning involves the analysis of relevant information from the present and the past, and the assessment of probable future developments, so that a course of action (plan) may be determined that enables the organization to meet its stated objectives. Planning must be completed collectively, and where time permits, deliberate and continuous planning must be attempted to ensure currency and relevance of existing hazard specific plans.

The Planning Process is simply a process completed collectively, when there is either a new objective, or a significant change in the situation that synchronizes the efforts of the Subject Matter, Coordinating, and Supporting Agencies. It is a logical sequence of collective reasoning leading to the best solution within the available planning time. The required agencies, under the guidance of the Coordinating Agency, collectively analyze the new objective or situation, develop and present options to governance, complete the plan of action, disseminate direction and prepare for further contingencies. The Planning Process is continuous and dynamic, involving concurrent activity and interaction between the key agencies, governance, and stakeholders. It also includes the conduct and evaluation of Lessons Learned following all training, exercises and real events. There are a variety of plans that can be created.

A short list is as follows:

Plan Model. Plan Models are created by a Coordinating Agency for a wide spectrum of stakeholders and provides a standardized format to ensure that plans are developed in a comprehensive yet easy structure. This permits individuals to quick find actions required of them, as they know exactly where in the plan to find their requirements.

Hazard Specific Plan. A plan created and maintained by the Subject Matter Agency to deal with emergency management functions for a specific type of hazard. Examples include Pandemic Influenza, Foreign Animal Disease, Counterterrorism and Crisis Management.

Contingency Plan. Contingency Plans are developed to support Hazard Specific Plans in unique situations. An example of this is the Mass Carcass Disposal Plan that could be implemented as part of a Foreign Animal Disease Plan.

Support Plan. Created by Supporting Agencies, these plans provide details of support to an overarching hazard specific plan.

Business Continuity Plans. As the name implies, this is a plan to permit the continuation of normal or temporarily reduced critical business functions during an emergency or disaster.

Lessons Learned Plan. The plan/process to ensure that all plans are dynamic and constantly improved, based upon observation gathered during real events or training, which are then collated, analyzed, interpreted, implemented and tested.

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2.4.4 Public-Private Sector Coordination

In almost all sectors of the economy and/or public sector, there are regulatory bodies which oversee some aspects of the operations. Examples include National Energy Board (NEB) for Oil and Gas, the Canadian Food Inspection Agency (CFIA) for livestock and food production companies, Transport Canada (Dangerous Goods) for Rail operations, provincial regulators for municipal water supply, provincial Health Authorities for the operation of Long-Term Care (LTC) homes, and many others. These regulatory functions can be either public sector or private sector but are almost always established by federal or provincial legislation. During an emergency, these relationships between the public and private sectors become even more important. Specialist teams to ensure this coordination need to exist and become strengthened in emergency operation.

2.4.5 Intelligence

Intelligence is the product resulting from the planning of information needs, collection, collation, evaluation, analysis, integration, and interpretation of all available information; that concerns one or more aspects of interest, and that is immediately or potentially significant to planning and operations. Intelligence activities within the emergency management context, are focused across all hazards, for all sectors. Examples include intelligence as it relates to human health hazards (World Health Organization), animal health hazards (Animal Health Coalitions), weather/environmental agencies, and security and intelligence agencies.

Types of Intelligence include:

Strategic. Strategic intelligence relates to long-term, potentially evolving threats, and can provide emergency management stakeholders with an overview of threats to safety and security. It can help senior management in determining how to allocate resources. It will identify international and national areas of concern, which may span periods of ten years or more. In addition, strategic intelligence is used to help form long-term mitigation and recovery strategies. Results from this level of intelligence will frequently assist in focusing provincial/state/territorial operational level intelligence activities.

Operational. Operational intelligence is of mid-term use in identifying specific, currently evolving threats. Using the results from strategic intelligence resources, operational intelligence activities are focused on the regional impact of emerging trends. In addition, operational intelligence focuses on hazards, which may be specific to one area. Operational intelligence focuses on periods from the present to three to five years, making its results important in business cycle planning. It is also vital for mid to long term recovery strategies, following emergencies which had had a significant economic or social impact.

Tactical. Tactical intelligence is of short-term/immediate use and relates to specific methods used to circumvent current threats and the hazard. Tactical intelligence is used in day-to-day operations but will normally cover the period of up to one year into the future. It can assist in short term mitigation strategies as well as be used to direct preparedness and response activities.

2.4.6 Logistics

Logistics is the activity associated with ensuring that the right resources are at the right place at the right time, in the right amount to achieve specific objectives as ordered by the governance agency and directed by the operational process. The discipline deals

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with the support related activities of the procurement, control, allocation, distribution, maintenance, and transportation of all resources (see next section on Emergency Management Resources).

2.4.7 Communications

Communications is the process of representing, transferring, interpreting, or processing information (data) among persons, places, or machines. It includes the actual means of transferring the information between people and organizations, as well as the preparation of the content of the information to be transferred. It is the process, which ensures that all agencies are aware of the appropriate information about what has occurred, what needs to occur, and what their role is to ensure that the required actions/activities do occur.

It can normally be broken into three areas:

Support of Government/Responsible Agency(s). This is the communication, to ensure that the appropriate activities for coordinating/subject matter/supporting agencies, can occur to address all hazards and their results. It includes ensuring that the responsible leadership can be advised of the situation, make decisions, and act in a coordinated and responsible manner. It ensures that confidence in government can be facilitated and that leaders can execute their roles and responsibilities appropriately.

Support of Public. This is the communication to ensure that the appropriate activities, by the public, can occur to address all hazards and their results. It includes ensuring that the public can be advised of the situation, make decisions, and act in a coordinated and responsible manner. It ensures that confidence in government can be facilitated, and that the public at large, can execute their roles and responsibilities appropriately.

Technical means. This is the activity to ensure that all appropriate forms of communications resources are available and operational, to perform the tasks described previous in this section. All forms of communications may be included, such as wire based systems (telephone, fax, teletype, internet, cable TV, cable radio, email), wireless systems (satellite phones, cell phones, TV, radio, ham radio, wireless internet, email), and print media.

2.4.8 Financial Management

This activity includes the establishment of funding, the management of those funds (allocation, control, accounting), the provision of those funds (cash, electronic, cheque) and the audit of those funds, in support of all emergency management activities.

2.4.9 Administration

The discipline of daily administration including personnel administration (policy, procedures, position establishment, personnel management, release, retirement, benefits), safety administration (policy, procedures, citizen, individual, worker, facility, equipment), records administration (policy, procedures, vital records, working files, official records, archives), and security administration (policy, procedures, personnel (screening, clearances), equipment security, facilities security)

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2.4.10 Education/Training

Training is the planned, systematic development of the knowledge, understanding, skill, ability, attitude and behavior pattern required by an individual and/or a team in order to adequately perform a given task or job. Achieving proficiency through training is a fundamental part of emergency management organizations capability and is implicit to the organizations ability to successfully execute its assigned role.

It can include:

Individual Training. Individual training is conducted as the precursor to collective training. It is an essential component to operational readiness and must be conducted systematically. It may include general awareness training or role specific training. Some examples include Personal Public Awareness Safety/Security programs, Orientation Training, Refresher Training, Professional Development, Academic Education, Advanced Individual Training (leadership, hazard specific, program/project management), Lessons Learned Process Design and Exercise Design training.

Collective Training. This training involves the collective efforts of one or more of the emergency management organizations, agencies and/or stakeholders. Collective training is the mechanism by which governance takes a full complement of qualified staff and, with time, resources and applied doctrine and standards, produces a cohesive team. The aim of collective training is to produce teams that are operationally capable of activating one or more of the operation sites/centers and work directly with agencies and stakeholders. This type of training may include community-based citizen programs, Emergency Site Command training, Incident Command System training, Operations Centre training, Plan evaluation exercises, Tabletop exercise, Communications exercises, Plan validation exercises, and Lessons Learned exercises.

2.5 The Fifth Dimension – The Seven Emergency Management Resources

Within emergency management there are seven resources that must be considered to guarantee success. Again, these seven resources are not exclusive to emergency management. In fact, they represent the resources required to complete a large complex program or project. Unfortunately, people often overlook or forget some or all of these resources' requirements, particularly during times of stress, and thus it is necessary to ensure that they are listed and understood by practitioners of emergency management, to serve as a checklist.

2.5.1 Personnel

Undoubtedly, people are the most critical of the seven resources, to emergency management. Not only is it important to have the correct number of personnel, with surge capacity and redundancy, but they must hold the correct qualifications, have adequate experience and be trained to work together as a team. The people must be available, motivated and dedicated. While some personnel will always be in training for certain positions, there must always be a fully qualified person available with them, as the field of emergency management is one where failure can cost lives.

2.5.2 Equipment

Every occupation requires certain forms of equipment, such as desks, chairs, cabinets, vehicles, photocopiers, printers, plotters, etc. This equipment must be available in sufficient quantity, be serviceable and be routinely inspected and certified. Appropriate

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dedicated maintenance staff must be available to repair the equipment as appropriate and the emergency management personnel must be familiar with their use and limitations.

2.5.3 Supplies

Supplies differ from equipment, in that, while essential for the performance of emergency management, once used, they are consumed. Supplies include such things as food, water, petroleum products, paper, ink, etc. Supplies as well must be held in sufficient quantity, be serviceable and routinely inspected, with staff familiar with their use. While not “maintained” per say, their condition must be monitored and stocks rotated, based on shelf life through a dedicated program.

2.5.4 Infrastructure

Appropriate buildings are required, for office space, for actual emergency operations (such as space for an Emergency operations Centre {EOC}), for storage of equipment and supplies, for communications assets, for meeting space, for planning functions, for secure intelligence functions, for emergency registration centers, for emergency housing and social services, etc. The infrastructure must be preplanned, be maintained, and be regularly used in realistic activities/exercises to ensure its continued applicability to its function.

2.5.5 Publications/Records/Documents

Frequently overlooked, emergency management requires access to a full range of publications, such as legislation, policy documents, written plans, procedures, aide-memoires, etc. In addition, access to vital records, previous historical activities, personnel records, medical information, animal health information, databases, and geographic information, are also essential. The storage, accessibility, control and handling of these records, which can frequently be classified or confidential in nature, is extremely important.

2.5.6 Finances

As opposed to financial management, covered previously under the ten activities of emergency management, this section refers to money as a resource. Money must be available in appropriate forms to emergency managers. This can take the form of cash, cheques, coupons, vouchers, electronic transfers, or even a simple IOU form. The allocation, pre-location/storage of cash, control, accounting, and auditing of this commodity can be essential.

2.5.7 Information Communications Technology (ICT)

While listed here last, this resource is equally essential to all, which has been listed previously. All forms of information and communications technologies may be included, as was stated in the previous section, under the activity of communications (wire-based systems {telephone, fax, teletype, internet, cable TV, cable radio, email}, and wireless systems {satellite phones, cell phones, TV, radio, ham radio, wireless internet, email}). In the previous section, the activity focused on the process to ensure the communications assets were available. Here they are listed as a commodity which must be provided. While in the past, these assets were simply considered as part of the “equipment” resource category, their complexity and specialized use has now required them to be considered separately.

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3. Integrating the Five Dimensions of Emergency Management

There are many ways to represent the integration of the five dimensions, to ensure completeness, while ensuring clarity. The two most frequently considered will be shown here.

The first methodology is to start with the four functions of emergency management - mitigation, preparedness, response, and recovery. By placing these four functions on the horizontal axis, and then listing the groupings/organizations/agencies on the vertical axis, we can depict inter-jurisdictional responsibilities and linkages, assuming that the table represents an "all hazards" approach.

All Hazards	Mitigation	Preparedness	Response	Recovery
International				
Federal				
Provincial/Territorial/State				
Regional				
Municipal				
First Responder				
Citizen				

Figure 1. Groupings and Functions for All Hazards

A separate sheet could be produced for each subgroup of hazards (as shown below), or in fact for each hazard thereby creating a three-dimensional table.

	Mitigation	Preparedness	Response	Recovery
International				
Federal				
Provincial/Territorial/State				
Regional				
Municipal				
First Responder				
Citizen				

Natural

Human Induced

Figure 2. Groupings, Functions and Hazards in Three Dimensions

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Then, for each box in the diagram, each of the ten activities must be applied to determine the actions required, to completely cover all necessary requirements. Each for each activity, one at a time, the resources required must be determined. Figure three depicts the function of mitigation, for the provincial order of government, for Natural hazards, being broken into its ten necessary activities, and then the first activity of "Governance" being resourced.

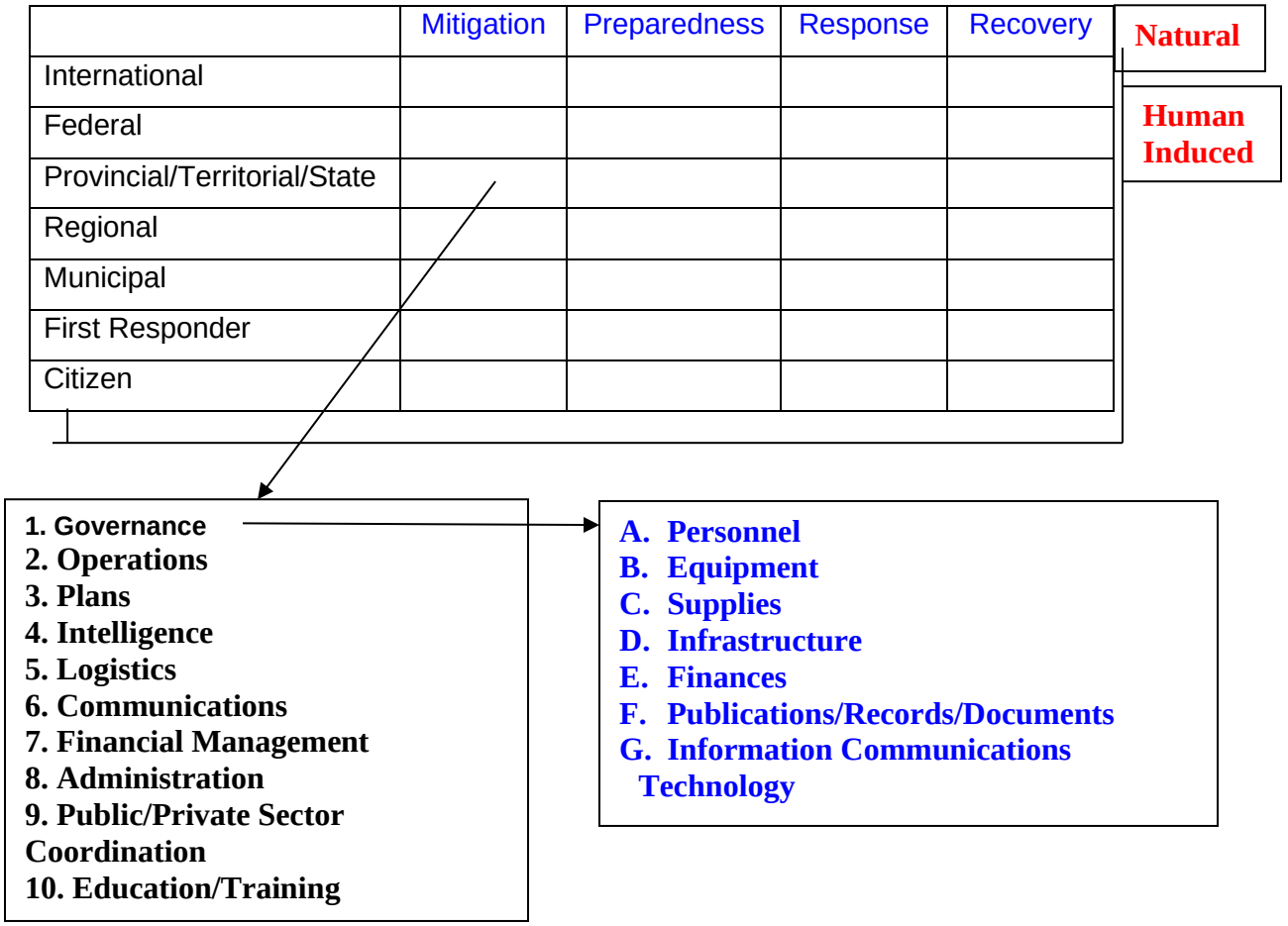

Figure 3. The Five dimensions integrated, version 1

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The second methodology most commonly used to represent the discipline of emergency management, is to commence with ten activities. This form is frequently used to link the discipline to standard work groupings, found in most private and public sector organizations. In Figure 4, this format is used for a provincial order of government grouping (other groupings then could be added in separate sheets) taking the activity of "Operations", for the function of Response, breaking up into hazards, and then resourcing for natural hazards.

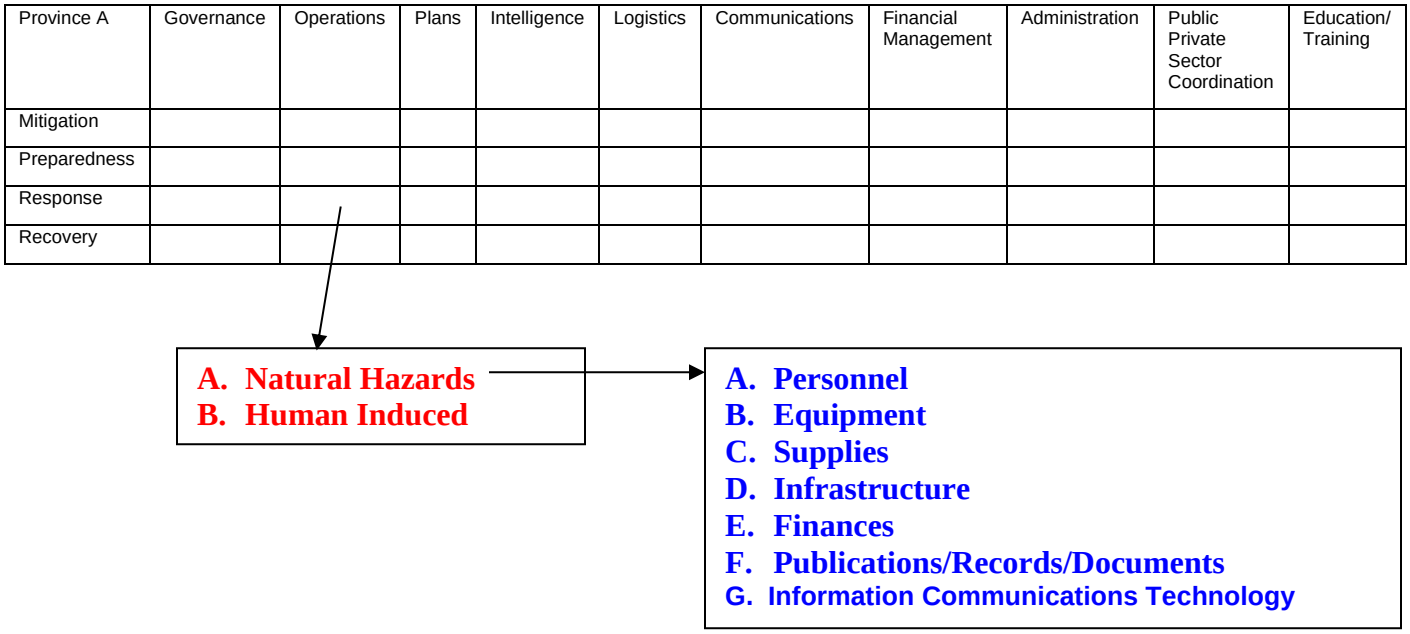

Figure 4. The Five dimensions integrated, version 2

Obviously, the discipline of emergency management can therefore be laid out in many formats, but the essential concept is that all five dimensions must be incorporated, or some potentially dangerous requirements will be overlooked.

This doctrine supplies a basis for discussion and comparison.

4. Conclusions

Here I have provided a framework for how Emergency Management should be done for any emergency. When experts in Emergency Management follow the doctrine they can coordinate all those involved to be sure that all aspects of any hazard are considered, and that all organizations/agencies, functions, activities, and resources of Emergency Management are coordinated and optimally active. Following this process is the only way to ensure the best outcomes from any emergency.

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References

1. Ministers Responsible for Emergency Management. An Emergency Management Framework for Canada, 3rd Edition. Public Safety Canada: Ottawa, ON. 2017. Available at: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/2017-mrgnc-mngmnt-frmwrk/2017-mrgnc-mngmnt-frmwrk-en.pdf [Accessed February 11, 2021].
2. Alberta Health. Alberta's Pandemic Influenza Plan. Government of Alberta: Edmonton, Alberta. 2014. Available at: https://open.alberta.ca/dataset/c89245b6-a7fc-4c24-be87-c2686341ffb5/resource/a652811e-42f2-4c0d-90af-54e0e759e05e/download/2014-albertas-pandemic-influenza-plan-apip-march-2014.pdf [Accessed February 10, 2021].
3. Public Safety Canada. Emergency Management Planning Guide. Public Safety Canada: Ottawa, Ontario. 2010. Available at: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-mngmnt-pnnng/mrgnc-mngmnt-pnnng-eng.pdf [Accessed February 12, 2021].