DISASTER MANAGEMENT: THEORY, PLANNING AND PREPAREDNESS

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ABSTRACT

Disaster management is truly a complex subject that is impacted by all disciplines of science and social science since both humans and the natural world interact, involving all facets. A fundamental premise must be that while most ***hazards*** *may not be controllable,* ***vulnerabilities*** *can be analysed and mitigated. Planners tend to be stuck in the past and have subjective perceptions of the future, which is why there is a need to objectively anticipate likely problems and options to evoke appropriate responses. The focus should be on coordination with true vertical and horizontal integration of the entire community and all organisations incorporated in the process. There is a difference between* ***planning*** *for disasters and actually managing them which could be due to poor planning processes, faulty templates, exclusivity, ignoring community dynamics, etc. Most aspects of preparedness are applicable in all contingencies, hazards and situations. These are* ***multi-dimensional*** *and span across organisational boundaries. Therefore, some general* ***principles of preparedness*** *can be enunciated. In case operations are dispersed and far-flung, there is a need to follow* ***distributed leadership*** *models with clear mission-command type orders from the higher leadership. Moving from a framework*

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Disaster management is affected by numerous issues from diverse subjects, some of which are: convergence; emergence; integration; collaboration; situation awareness; common operating picture; capacity and resilience building; flexibility and adaptability; and, planning and preparedness.

of relief and rehabilitation to an institutional framework that holistically encompasses all aspects of disaster management is a Herculean effort undertaken successfully by India. The key to resilience in disaster is ***capacity-building of local communities****, which has to be contextualised to local hazard mapping and vulnerabilities.*

DISASTER THEORY

Theory in any field or subject serves many purposes. It may be an idealistic template by academicians that they want promoted in society or it could represent the complete knowledge available on the issue. Theories strive for accurate definitions to allow meaningful research and debate, formulate concepts around which learning can take place and elucidate ethical standards in a profession. Models, classification and typology in theories help in defining and linking variables to give meaning to academic constructs. Theories can generate paradigms that evolve and explain causal relationships between variables, which allows identification and solutions to problems in a logical manner.

While a single theory around a phenomenon can unify diverse views and ideas in order to give semblance and direction for applications, it must not constrain inclusivity of diverse and out-of-the-box ideas and explanations. For example, the Theory of Comprehensive Emergency Management had traditionally constrained work around disasters with a focus on reaction, till newer ideas such as emergence, chaos theory and theories based on community resilience gave newer and more meaningful insights. Models such as incident command systems are being challenged with ones based more on collaboration rather than control. Disaster management is affected by numerous issues from diverse subjects, some of which are: convergence; emergence; integration; collaboration; situation awareness; common operating

picture; capacity and resilience building; flexibility and adaptability; and, planning and preparedness.

Today, the focus has firmly shifted from response and preparedness to a more holistic disaster risk reduction strategy.

Historically, disaster theories were overly influenced and funded by military approaches to issues of war and conflict, especially nuclear scenarios. The focus shifted in the 1960s-70s to technological or man-made disasters such as the Bhopal tragedy, and then on to natural hazards like earthquakes and floods. Concepts also shifted from emergency management, which signified a reactive and false belief in the ability to control, to disaster management encompassing the four recognised phases, focus on communities, etc. The debate on what is a disaster still goes on, with variance on issues such as area affected, affected population, coping capacity, significant losses of lives and property, and displacement of communities.

Over the decades, the focus has also shifted from hazards, since all should not, or may not, lead to disasters, to vulnerability which accounts for hazards, capacities and a possibility to avert disasters by foresight and planning. It also has the ability to localise context and focus on practical issues. Complexity in linking numerous variables involved in this field, some in the control of man and others only of nature, also made it clear over the years that there was no silver bullet or one solution. It also became clear that while the four phases of disaster management were good for clarity and understanding, there were complex overlaps and each affected the efficacy of others in the short and long runs. Today, the focus has firmly shifted from response and preparedness to a more holistic disaster risk reduction strategy. Also, while government oversight is important, it is not possible to get the best results without actively involving all sectors and actors, i.e. Non-Governmental Organisations (NGOs), community participation, private sector, specialised fields (medical), etc. This blurring of sectors and functions will intensify further in the future towards a more integrated approach.

This is truly a complex subject that is impacted by all disciplines of science and social science where both humans and the natural world interact, involving all facets. A fundamental premise must be that while most hazards

may not be controllable, vulnerabilities can be analysed and mitigated[1]. The first responders and most affected are the communities, and that is where the focus must lie. Integrating all this into sustainable development plans that holistically look at humans and their environment is the current focus of this field. There are major political and organisational ramifications which need to be addressed by the leaders. One thing is for sure: disasters will continue to surprise the best laid-out plans. Adaptability and improvisation must never be lost sight of in responding effectively.

AN INTEGRATED APPROACH TO VULNERABILITY

Is there a concept that can holistically guide the disaster management policy and action? From a historical focus on the hazard itself, theorists have moved to sustainable models of mitigation, yet even they have focussed on natural hazards only. Also, this tends to ignore the response and preparedness phases which makes it less comprehensive. It assumes no surprises by nature, with development following sustainable lines. The change of spotlight onto social, economic and political factors started in the 1980s. It was realised that vulnerability was the root cause of disasters, but what constituted vulnerability was a debatable issue. Many factors contribute to vulnerability such as poor land-use, faulty construction, damage to the environment, cultural practices and beliefs, failures of early warning, ineffective communication, etc. These may be vulnerabilities due to displacement and demographic pressures, settlements dictated by economic and social discrimination, etc. Therefore, any holistic view will factor many diverse fields and look at it from two angles: the external manifestations of risks, impact and stress on people; and, the internal capacity to cope and bounce back. Some social scientists have classified it as "event and consequences vulnerability".

There are mainly four schools of thought on the issue of reducing vulnerability. The Physical Science School analyses location and exposure to hazards and commits to early warning, planned development with avoidance

1. David McEntire, "The Status of Emergency Management Theory", Paper presented at FEMA Higher Education Conference, Emmitsburg, MD, USA. FEMA website.

of hazard prone areas, relocation of entire populations, etc. It ignores the socio-economic reasons for such settlements and the impracticality of relocating entire populations. The Engineering School believes that nothing is insurmountable by architecture, building materials and design, and other such technological advances. It tends to ignore the cost factor, especially for the impoverished sections of society. The Structural School recognises the susceptibility caused by socio-economic and demographic factors such as race, ethnicity, gender, age, poverty – in other words, vulnerability caused by social structures. The last is the Organisational School that focusses on resilience which is a mix of good response and recovery actions, preparedness, leadership and management of these processes, and adaptable action in general. It assumes that disasters can never be completely eliminated. A vulnerability model[2] holistically incorporates risk and susceptibility as liabilities, while resistance and resilience fit into capabilities. With the help of statistics, computer-based analysis and mathematical modelling, scientists can quite accurately map out vulnerability. This allows comprehensive management of disasters and the model can be applied to all hazards, i.e. natural, chemical, industrial, biological, technological, etc.

PLANNING PRINCIPLES

While planning and preparedness go hand in hand, subtle differences between activities is important for objective evaluation of states of readiness. The nuances of the two in terms of general principles behind activities are to be clearly understood. It is testimony to their sound and logical foundations that these have hardly changed over decades of evolution of theory and practice with great advances in technology. The latter part of this article traces the evolution of these issues in India and suggests some measures ahead.

Planners must recognise that disasters are crucially different from minor emergencies; there are major qualitative and behavioural differences[3]. Some

2. David McEntire, Colleen Crocker, and Ekong Peters, "Addressing Vulnerability Through an Integrated Approach," *International Journal of Disasters Resilience in the Built Environment*, vol I, no 1, 2010, pp. 50-64. www.emeraldinsight.com.
3. EL Quarentelli, "Ten Criteria for Evaluating the Management of Community Disasters", *Disasters 21*, 1997, pp. 39-56.

examples are: forced interaction between unfamiliar groups on a large scale, curtailing of autonomy, performance quality of organisations, and public-private coordination. Plans must be generic rather than agent- specific; the issues are more to do with time spans, intensity, predictability, speed, early warning, etc. rather than agent-specific focus. This allows capability building with cost-benefits, efficiency, and effectiveness across the entire span, and involves all potential actors. Focussing on general principles and not specific details is important since being too specific may not fit the actual conditions that would inevitably be unique. Simple points need to be developed to encourage adaptability, which allows emergence of ad hoc networks that are essential for flexible responses.

The focus must be on planning processes rather than a written document, and on holding meetings to share information, drills and rehearsals, techniques for training and knowledge transfer, mutual aid and understanding, public education, establishing linkages, community-based plans and revisiting for revalidation[4]. Plans should be based on what is likely to happen because while the past has lessons to be learnt, study of hazards and vulnerabilities indicates the possibilities ahead. Planners tend to be stuck in the past and have subjective perceptions of the future which is why there is a need to objectively anticipate likely problems and options to evoke appropriate responses. Uncertainties are permanent features, and the aim is to reduce them to a manageable level. There is a clear link between cognition and action in disaster management that allows managers at all levels to innovate, adapt and align to the larger objectives. Planning must aim to reduce impulsive actions and encourage logical but timely decisions[5]. This is only possible with a truthful and objective after-action analysis of events of the past.

A 'command and control' structure that is premised on the total breakdown of social structures and community capacities of natural and spontaneous behaviour is a fundamental mistake of planners. The focus instead should

4. "National Disaster Management Guidelines- Incident Response System," NDMA Publication, NDMA Bhawan, Government of India, July 2010. ISBN-978-93-80440-03-3.
5. Louise K. Comfort, "Crises Management in Hindsight: Cognition, Communication, Coordination and Control", *Public Administration Review*, December 2007, Special Issue. www.researchgate.net/publication/227604591.

be on coordination with true vertical and horizontal integration. Unless the entire community and all organisations are incorporated in the planning process, an effective blueprint may not be possible. Education, at all levels, is a key theme of preparedness, with regular review and updating catering for changes in the status of resources and people. Time-tested social science knowledge must govern thought and action. For example, the wrong premise of social breakdown, mass panic, over-hyped role of outside agencies, etc. must be replaced by an understanding of community-based resilience and capacities[6].

Criteria: As per EL Quarentelli, the following criteria of managing disasters are fundamental. There is a difference between planning for disasters and actually managing them. Management brings in problems of command and control, communication channels and processes, and coordination mechanisms. Actual events that have been studied over the years indicate a sizeable gap between planning and actions to manage disasters. In the first place, this could be due to poor planning processes, faulty templates, exclusivity, ignoring community dynamics, etc. Thus, the first step to effective disaster response is distinguishing between the two.

Communication is the backbone of any disaster response, and the real issues are of what is communicated rather than how. Case studies show that some mode of communication continues to exist and actors adapt well to ensure its flow. The problem is distortion and volume that affect disaster management. Four broad types of communication channels or flows are critical in a disaster: inter-organisation, intra-organisation, public information and feedback from a community. Each flow will face difficulties of information overload, distortion, delay, restructuring to meet demands, emergent networks and informal channels, among many other issues.

The response to a disaster leads to additional demands which are different from those created by response-needs. Convergence of 'many' on the disaster scene needs management of mobilisation, delegation, division of labour, coordination, communication channels and decision-making structures.

6. "Uttrakhand Disaster 2013: Lessons Learnt", Report on National Workshop by the NIDM, August 2013. www.nidm.gov.in

Information must flow freely and accurately, and networks have to incorporate vertical and horizontal freedom, and flexibility to support emergence.

Personnel and resources must be mobilised in an effective and efficient manner, including management of the volunteers and aid flowing in. The criteria are early identification of needs, assessment of capacities and timely deployment in appropriate measure. Division of labour and delegation of tasks among all the agencies may also require consideration of emergent groups and networks. Importantly, changes in tasks, load, responsibilities partnerships, etc have to be accepted in a dynamic environment. Therefore, tasks, and the groups undertaking them, would vary from the routine, and planned for emerging new needs and solutions.

Generic needs exist in all disasters – only the scope and span vary — e.g. housing, shelter, warnings, evacuation, medical needs, search and rescue and property protection are common themes. Good assessments must lead to adequacy of response for each case. Real needs must be met in an efficient and timely manner. Information must flow freely and accurately, and networks have to incorporate vertical and horizontal freedom, and flexibility to support emergence. Proper decision-making can only be possible if problems of fatigued leaders due to overwork, conflicts over responsibilities, overlapping organisation domains, acceptance of emergent groups and jurisdictional issues are resolved at the earliest. Emergent phenomena are a reality in terms of groups, behaviours and networking, which allows flexibility of response and creative solutions. Incorporation of emergence with other activities on the basis of shared values and norms can be attempted.

Coordination must not be confused with control[7]. This issue can lead to lack of cooperation between agencies. Similarly, the differences in the perspectives of the private and public sectors have to be well understood to manage coordination. The time to develop a leisurely understanding is not available. The way forward is to de-emphasise organisational leadership

7. Norbert Steignberger, "Organising for the Big One", Proceedings of ISCRAM 2015, Conference at Kristiansand, May 24-27, 2015. steignberger@wiso.uni-koeln.de.

with abundant use of tact, sensitivity and quick trust-building acts. The media must be used proactively and positively to affect, educate, update and warn about public perceptions in a disaster; and the revolution in information technology must be fully taken advantage of to carry out these functions. An Emergency Operations Centre (EOC) is a function, a place and a structure around which disaster management is coordinated among various groups, agencies and communities[8]. It must finally be a social system based on a functional approach to problem solving and information sharing.

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DISASTER PREPAREDNESS

Attributes and Activities: Disaster preparedness straddles the areas of mitigation, response and recovery; i.e. it encompasses action to respond to life-threatening situations, ability to take action to protect life and property, as well as action in post-disaster recovery facilitation. Theoretically, mitigation action is undertaken well before the impact point of a disaster, with structural activities such as strengthening buildings, elevating housing, and non-structural such as policy-making, land-use planning, etc. Response preparedness involves short-term recovery. Some activities such as early warning, public awareness and communications span both mitigation and preparedness. The Federal Emergency Management Agency (FEMA) objectives list out the attributes of preparedness and expected specific activities against each[9]. Some of these are as follows:

- **Hazard Knowledge, Management and Coordination:** This includes various assessments, estimation of potential impacts using latest technology and computer simulations, and disseminating these to all

8. Paul Salmon, Jenkins Stanton and Walker, "Coordination during Multi-Agency Emergency Response: Issues and Solutions", *Disaster Prevention and Management*, vol 20, no 2, 2011. www.emeraldinsight.com/0965-3562.htm.
9. "CERT 1: Disaster and Preparedness", *Participant Manual*, FEMA, USA. www.fema.gov

the stakeholders. Community-based disaster scenarios are good tools to evaluate preparedness. Lines of authority and responsibility, control and distribution of resources and decision-making chains have to be identified. In many cases, management groups and incident management systems may need to be established. Prior to impact, training, drills and exercises to clarify roles and responsibilities are must-do activities. An important aspect is policy formulation that sets the objectives and clearly assigns responsibilities and accountability.

- **Plans and Agreements:** Plans will be formal and informal, covering Memorandums of Understanding (MoUs), mutual aid schemes and informal agreements. Common objectives and vision are set that allow division of work and tasks. The coverage needs to be broad, incorporating community-based organisations, volunteers, NGOs, and societies such as the Red Cross. In conjunction with planning, there is a core requirement to identify needs, acquire resources and effectively distribute them in the pre and post-phases as well as during the active response one. Every activity, e.g. protection, search and rescue, debris management and medical help is resource hungry and this needs to be factored in. Among various resources are the key ones of skilled manpower and communication set-up. Also, redundancy needs to be built in by identifying alternatives. Even the post-response phase of recovery needs to be planned. Some of the initiatives and early action will be taken in the response phase to set the framework for restoration activity.
- **Life Safety:** The response must factor in life-saving issues such as first-aid supplies, evacuation plans, routes and means, networking of hospitals, etc. Leaders must be able to immediately chalk out incident stabilisation, damage assessments and earmarking of resources and responsibilities. Most activities in terms of protection of property are pre-impact except early warning and communication which span the entire time-line. Building codes and standards enforcement, retrofitting and reinforcing, removal of hazards (if possible) and preservation of critical assets are some of the large number of mitigation activities.

- **Flexibility in Response:** Plans bring structures to think and act by a group but they cannot be rigid since every disaster will throw up surprises and unexpected situations. The need to improvise, innovate, adapt and in general do creative problem-solving is a characteristic of all major disasters. This needs to be encouraged and practised in exercises, scenario-building, table-tops and discussions. Restoration of critical services to allow response activities is an area that must be well thought out together by all the stakeholders.

General Principles of Preparedness: Most aspects of preparedness are applicable in all contingencies, hazards and situations. These are multi-dimensional and span across organisational boundaries. Therefore, some general principles of preparedness can be enunciated.

- Formal written plans are just the first step and must be followed up by training, practice, updating and regular revision. Lesson-learning from recent disasters, best practices of others and seeking information to update and upgrade are equally important activities.
- Plans are just documents unless backed by resources, practise by stakeholders and active ownership by all.
- To think of plans as a panacea is a myth waiting to be proved wrong. Rather than a product, plans are a process to develop confidence, trust, credibility, knowledge and efficiency among partners. They also allow gaps to be identified for rectification.
- Assumptions in planning have to be realistic and based on the facts of the community and environment. For example, the strengths and resilience of the people need to be factored in and not the assumption that they will panic and be unruly.
- Collaborative themes are dominant in the diversity of actors; therefore, only a top-down approach may not be effective. Challenges also include turf battles, jurisdictional problems, weak structural arrangements and poor leadership[10].This is also of great relevance when engaging the community as a whole.

10. Alexander Kouzmin, Man Jarman and Uriel Rosenthal, "Inter-Organisational Policy Processes in Disaster Management," *Disaster Prevention and Management*, 4, 1995, pp. 20-37.

- While specialists and experts will play important roles, plans must involve the community and participants who will actually take part – it is the key to effective planning. Strategies for preparedness must be as broad-based as possible, incorporating all the stakeholders.
- Paucity of time and resources may put preparedness for disasters at a lower priority. Active and vigorous education of leaders and the community can put it back on track. Advocacy of the subject is important to avoid the higher and fatal costs of ignoring it.
- An all–hazard focus and built–in flexibility to adapt, innovate and be creative will allow far better plans for preparedness.

Planning and Flexibility: Despite the best efforts spent in planning and exercising, disasters do unfold in unexpected ways and overwhelm capacities and bring in the need for flexibility of the thought process, for improvisation, quick innovation and creative problem-solving. So, how do planning and flexibility go together? Firstly, experience shows an inverse relationship between planning and improvisation — lack of planning will demand the highest need to improvise. Planners provide a framework of responsibilities, relationships, clarity on who does what, etc. At the same time, continuous assessments of the situations allow flexibility around this framework to adapt and improvise, thereby retaining coherence and avoiding chaos. Therefore, planning and flexibility do complement each other; rigidity of thought and other cognitive processes is the last thing that planners advocate or aim for.

SOCIAL CAPITAL IN DISASTER MANAGEMENT

What is social capital and its role in disaster management? It is an innate resource of the social framework that greatly facilitates action by individuals of the family, group or community. Just as physical capital is created by changing materials to make tools, and human capital by changing knowledge and skills for providing capabilities, social capital aims at changing relationships among people to assist action. It is not very tangible in terms of measurable scales, but is evident to keen observers. Social interaction generates obligation, expectations and reciprocity that

are essentially predicated on trust and factual interdependence among people. These are greatly influenced by factors such as economic status, culture, local practices and community bonding. Not only are members of the community the first-responders, they are active, and perhaps, the most effective participants in the entire gamut of disaster management activities. Most volunteering is a result of obligations and a sense of community duty rather than a failure of the administration capabilities of state authorities.

Dissemination of knowledge and information has credibility when mixed with local cultural preferences and methods rather than just relying on media or technology. For example, successful evacuations are possible only when belief in the message by the authorities is passed and confirmed among the community. Therefore, planners must design early warning and other messaging around this context and complement existing communications networks. Evolved social structures have the resilience and methods to deal with unexpected circumstances. These are based on beliefs of altruism and division of labour founded on trust within the group. It is rare for a community as a whole to panic and fall apart, as many outside helpers would like to believe and assume. The accepted and defined hierarchy and authority structure in families and communities are not laid down in black and white, and yet work very well even under pressure.

An accepted version of organisational authority as a social capital is the Disaster Research Centre (US)[11] typology which frames changes in an organisation on the references of structure and tasks. An established (Type I) authority framework comprises the pre-existing and well-rehearsed everyday structures such as the fire service or police. Type II has a similar authority structure but gets expanded by volunteers who have earlier worked in the same set up, e.g. retired fire service personnel. Type III extends along the task line by the addition of new but existing organisations such as religious groups which join in the task. The group structure is maintained while they adapt to the new task. Type IV is an extension along both task and structure axes, and

11. DA McEntire, "Searching for a Holistic Paradigm and Policy Guide: A Proposal for the Future of Emergency Management," *International Journal of Emergency Management*, vol I, no 3, 2003, pp. 298-308.

Social coherence and viability in disasters is well documented in contrast to the myth of social collapse. Emergent social action cannot be wished away by command and control fixated authorities. It is a mainframe around which supplementary planned action needs to be organised before, during and after a disaster.

is an emergent organisation wherein an ad hoc task-oriented relationship divides labour on acceptable functional lines.

Over the decades, disaster management and emergency response have been incorporated into governance, especially at the local level. Municipal duties now include professional and trained capacities to meet these obligations. Public administrators are formally trained in the discipline and undergo refresher courses in their careers. There are university courses at all levels and research into localised contexts is picking up all over. The USA has provided leadership in these aspects, and FEMA has been somewhat replicated in most developed and developing countries. Certification and standardisation of all this effort is critical in ensuring professionalism and accountability across the board. If it is accepted that hazards are physical aspects in control of nature, and disasters are primarily social constructs, then the way to deal with vulnerabilities is through strengthening the social capital. Social coherence and viability in disasters is well documented in contrast to the myth of social collapse. Emergent social action cannot be wished away by command and control fixated authorities. It is a mainframe around which supplementary planned action needs to be organised before, during and after a disaster. Some specific suggestions by Dynes[12] are as follows:

- Use existing social networks to spread awareness of disaster responsibilities, duties and self-help ethos.
- Involve local groups and communities in the planning and training. Local capacities of resources and skills need to be mapped by them, with help from the authorities.

12. R Russel Dynes, "The Importance of Social Capital in Disaster Response", *Preliminary Paper* #327, 2002, Disasters Research Centre, University of Delaware.

- Patterns of social habits, cultural preferences and routines must form the basis of plans.
- It is better to build on existing social platforms rather than thrust new structures that may not be accepted. This is applicable as much to the authority structure existent. It needs to be supported in a crisis, and not usurped.
- A key focus is normalisation of essential services to at least a base level to allow communities to display their resilience in recovery.
- A focus on social capital allows strengthening of capacities against vulnerabilities.
- External aid is a double-edged weapon since it can jeopardise and destroy the age-old social capital. This has to be deeply thought out by the higher authorities and agencies.

Legal and policy frameworks can seriously impinge quick decision-making and leaders need flexibility and adaptability to deal with rule-bending requirements.

LEADERSHIP IN DISASTER RESPONSE

What is Leadership?: Leadership is the ability to motivate and guide groups and communities to achieve goals by providing focus, inspiration and direction. The response phase in a disaster is critical since life and death situations exist and it has elements of search and rescue, medical triage, stabilisation and care to victims, and evacuations. There are myriad challenges of logistics, coordination, information dissemination, prioritisation of resources and capacities, and taking key decisions, with large consequences. Legal and policy frameworks can seriously impinge quick decision-making and leaders need flexibility and adaptability to deal with rule-bending requirements. Leadership competencies vary in all phases of disaster management, however, awareness and knowledge of these will allow leaders to facilitate laying the bedrock for subsequent phases. The pace of decision-making, risks of failures and consequences, information and analysis voids and constant public glare make the response phase the most demanding in terms of the leadership competencies required — especially those related to adapting to dynamic changes — situational awareness and risk-taking abilities.

Leadership Theories: Early leadership concepts were based on heredity and heroism, with emphasis on innate qualities and skills such as personality, charisma, intelligence, integrity, determination, sociability. Contextual issues led to refinement to a trait-based approach — or the Traits Theory. Some of these skills such as confidence and judgement are still relevant today. In the early 1950s, the focus changed to skills and traits that could be learned. However, both these did not explain interaction with others, especially followers. The Behavioural Theory explored what leaders actually did, including their interaction with followers and team members. Distinct styles such as autocratic, democratic and *laissez faire* were identified. The Situational Theory was a follow-up, with leaders changing behaviours to fit the situation. This also emphasised on the motivational needs of team-members and a trust- and inspiration-based relationship, which led to the Transactional Theory between 1960 and 1980. Being on the same page and having a shared vision are some of the nuances involved. Leadership is now evolving into terms such as integrative, where the leader, the follower and the situation all determine its effectiveness and success, and shared and distributive forms where there is little emphasis on single or individual-based theories. For example, the right leader for the right job may involve multiple leaders at varying phases from different organisations. In a disaster, normal people may need to be inspired to do extraordinary things while a mitigation phase may need educated reasoning to convince them of the radical life-affecting changes to be made.

What are the Skills Required?: What are the essential skills that a leader must possess to effectively manage the response phase in disaster management? The first skill is of the cognitive domain, encompassing a rich and profound understanding of the complexities and challenges ahead. A leader must have a clear insight into problems, vulnerabilities, resources and capacities to allow quick and creative problem-solving. The second skill is of being decisive in an environment characterised by confusion, information gaps and acute need for prioritisation of decisions. In case operations are dispersed and far-flung, there is a need to follow distributed leadership models with clear mission-command type orders from the higher leadership. Another facet of decisiveness is flexibility to modify orders as demanded by the situation.

The third skill is communicating with not only own team members, but also all stakeholders and the affected community. Breakdown or overload of communication is a top area to be looked at. What is communicated is critical in terms of credibility, appropriateness and de-confliction of ambiguity. Understanding of the technology in hand can truly empower leaders to communicate effectively. The fourth skill related to communication is laying a network to connect to all the stakeholders. This is where personal charisma, vigour, personality and understanding of other organisations play an important role. The fundamental tenets of effective networking in disasters are trust and mutual respect. Another skill that distinguishes good disaster response leaders is accountability by being transparent in all dealings, aiming for high levels of integrity in resource utilisation and relying on true and verifiable feedback. Adherence to high moral values and legalities allows credibility to grow. The final skill is having an open-mind that has a high learning curve. This allows true assimilation of experiences, lessons learnt and new knowledge from others. This is critical to leaders who bring change in an organisation in order to adapt to newer requirements.

DISASTER MANAGEMENT: INSTITUTIONAL MECHANISMS IN INDIA

Moving from a framework of relief and rehabilitation to an institutional framework that holistically encompasses all aspects of disaster management is a Herculean effort that has been undertaken successfully by India. The legacy of knee-jerk reactive actions under the Ministry of Agriculture has been replaced by an organisational effort down to the district levels in the framework under the National Disaster Management Agency (NDMA) in 2005. The International Decade for Natural Disaster Reduction (IDNDR) between 1990 and 2000 brought out a vision, a legal and constitutional framework, and other such issues. A high powered committee under the chairmanship of JC Pant holistically reviewed Disaster Management (DM) in India and put forth major structural recommendations. A comprehensive framework was established after the DM Act 2005 with a clear hierarchy and linkage right down to the

village levels. An interesting issue being debated is a suggestion for a rights-based approach, e.g. "Right to Safety"[13].

Policy formulation leads to realistic planning, and the process has been kick-started with professional approaches and centre-staging risk management. Awareness and the involvement of the local government and communities is a key to effective policies and plans. Integration of stakeholders, traditional coping mechanisms, political commitment, a standard operating procedure for risk reduction are some of the ideas being propounded and experimented with. Vulnerabilities faced by India in terms of global warming and its impact on climate change, earthquakes, floods, epidemics, cyclones, etc. point to the imperatives of disaster risk reduction. For every rupee invested in disaster reduction, at least three are saved in terms of post-disaster costs. A national plan mandated by the DM Act has to incorporate measures for the prevention of disasters, integration of mitigation measures into development schemes, capacity building and delineation of roles and responsibilities. Plans are being formulated and revised regularly down to the village level. The work done by the NDMA, National Institute of Disaster Management (NIDM) and the states are illustrative of the change in emphasis. The Third Report of the Second Administrative Reforms Commission on Crisis Management 2006 has mainstreamed early warning concepts and practices, level of training of first responders, training of search and rescue teams, community practices and involvement of all stakeholders in table-tops, mock exercises, etc. Importantly, genuine feedback and a lessons-learnt approach are advocated as critical issues in preparedness.

Issues in Disaster Response: An important component in the disaster field is high-end technology. Along with this, and complementing it, is expertise based on scientific and social knowledge. Both will lead to capabilities in responding to the changing nature of disasters in terms of uniqueness, newer challenges, impact, scope and complexities. The Uttrakhand forest fire in May 2016 has shown some glaring gaps in capacities at the national,

13. OS Dagur, "Armed Forces in Disaster Management: A Perspective on Functional Aspects of Role, Training and Equipment", *Manekshaw Paper No 4*, Centre for Land Warfare Studies (New Delhi: KW Publishers Pvt Ltd).

state and community levels. A focus on disaster risk reduction and capacity building will address response problems. The National Disaster Response Force (NDRF) was set up as a national capacity to handle large disasters and to augment state-level capacities when gaps were noticed. It has evolved into a highly specialised and multi-skilled body that has been deployed across the country for quick response to natural or man-made disasters, including Chemical, Biological, Radiological, Nuclear (CBRN) disasters. The under–six-hour quick deployment in Nepal has not only shown maturing capacities, but also high levels of political will. The National Disaster Response Force (NDRF) has to focus on the following in the future:

- **Management Practices:** A collaborative model to facilitate the numerous actors in a disaster scene needs to be adopted and skills honed in this area. The leadership needs to be familiar with the inter-agency work and the nuances of coordinating multiple actors.
- **Technology:** There is a need to propagate the science of micro-zoning across all states through the various centres. There also is a need to absorb hi-tech communication equipment, especially that relevant to remote and dispersed location operations.
- **Systems Development:** There is a need to standardise disaster language across the nation, as also be aware of its compatibility with what is followed internationally. Emergency Operations Centres (EOC) are a critical need in all states, and, especially, in vulnerable districts. The concept of mobile EOCs is also relevant for geographical remote actions.

After the passage of the NDMA Act 2005, the three-tier structure advocates setting up of assessment, analysis and response mechanisms at each level. A State Disaster Response Force (SDRF) is one of the key mechanisms suggested in the Act. While 22 states have notified the setting up SDRFs, only 10 have effectively managed to do so. It is notable that most have done so in reaction to calamitous events, e.g. Orissa (1999 cyclone), Bihar (2009 Kosi floods), Gujarat (2001 earthquake) and Uttrakhand (Himalayan tsunami 2013). The SDRFs have some obvious advantages such as familiarity with the local language, culture and sensitivities, awareness of local resources

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and capacities, and being directly involved with local capacity building and networking. There are also some key challenges for SDRFs. First, the manpower is on deputation from the state police forces and is temporary, affecting continuity issues, specialisation and experience. There is a need to look at other agencies from which skilled manpower can be absorbed. Second, training suffers because of lack of infrastructure and skilled trainers, especially for long durations. Third is the paucity of funds at the state level and the low prioritisation of this sector. For example, two additional battalions of the NDRF were cleared quickly only in the aftermath of the Nepal earthquake. Fourth, good practices in setting up a robust communications network, with redundancy, comprise a priority, but need funds and clarity of vision. Lastly, working for community capacity-building requires commitment which is difficult to find in reluctant deputationists.

THE WAY AHEAD

The key to resilience in a disaster is capacity-building of local communities. This has to be contextualised to local hazard mapping and vulnerabilities. The effort must be to raise awareness levels, motivate communities for involvement in activities, and focussed capacity building in terms of leader training, trauma care, first-responder skills, etc. A focus on the youth in schools and colleges would be a correct long-term investment. Equally important is the motivation of the civil authorities and government officials towards this work. Disaster risk reduction has to be effectively integrated with economic development agendas at all levels of the government. Synergy of efforts by the government and NGOs towards this needs to be facilitated and encouraged in a structured manner. There is a paradigm shift in this field from response and relief in the post-disaster period to mitigation and preparedness in the pre-disaster period. However, hazards will continue to create surprises in the form of disasters and this will demand charting

out a flow of activities envisaged. A disaster protocol to handle different agencies, NGOs, volunteers and multiple capacities needs to be in place and managed in an adaptive manner in the aftermath. Vulnerability and resource mapping will give the NDMAs an ability to respond quickly and effectively. Trained and identified personnel from the National Social Service (NSS), civil defence and trained communities will allow a first-rate initial response to be supplemented by subsequent specialised efforts in the form of the SDRF and NDRF.

Local constraints will dictate the specifics of the response, e.g. narrow by-lanes may require motorcycle-borne fire-fighting elements. Innovative strategies in processes and problem-solving will best emerge in the context of local knowledge in a crisis.

It is important that community leaders be involved in the planning process since templates for all conditions are not possible. Local constraints will dictate the specifics of the response, e.g. narrow by-lanes may require motorcycle-borne fire-fighting elements. Innovative strategies in processes and problem-solving will best emerge in the context of local knowledge in a crisis. Another example is the training in first aid and trauma care of capable community members which can help save lives in the golden hour of the disaster. Resource mapping will include rosters of medicos, hospitals, para-medics, etc, and networking and legal structures to ensure transfers, triage and other life-saving measures. While surprises will continue in disasters, nothing should stop the responding communities and agencies from preparing for uncertainities and unpredictabilities. Every disaster response must be critically studied to learn the right lessons. The key is adaptability to changing demands, urgencies and priorities.