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Theory Building in Disaster Management: Intricacies and Barriers

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Abstract

The focal and prime aim of this paper is to look into the relative possibilities impossibilities with reference to theory building in the discipline of emergency/disaster management. It seems plausible to have concrete knowledge based conceptual scholarship in every discipline that adds value towards relative functions and operations within the close proximity of that discipline; vis-à-vis, it even enriches and enlarges the information network that provides primary foundation to transform a disaster management organization into a learning organization.

Keywords: Disaster; Theory; Framework; Emergency; Management

Introduction

The focal and prime aim of this paper is to look into the relative possibilities and impossibilities with reference to theory building in the discipline of emergency/disaster management. It seems plausible to have concrete knowledge based conceptual scholarship in every discipline that adds value towards relative functions and operations within the close proximity of that discipline; vis-à-vis, it even enriches and enlarges the information network that provides primary foundation to transform a disaster management organization into a learning organization. This paper encompasses, philosophical and sociological underpinnings coupled with five definite variables that hinder the possibilities of generalizability needed to establish a theory. Furthermore, this research initiative incorporates previous work with reference to captioned subject and adds novel dimensions, so that process of theoretical progression can be regressed plausibly.

Ontology of theory

Business dictionary defines theory as A set of assumptions, propositions, or accepted facts that attempts to provide a plausible or rational explanation of cause-and-effect (causal) relationships among a group of observed phenomenon. The word's origin (from the Greek thorós, a spectator), stresses the fact that all theories are mental models of the perceived reality. Theory is simply a meditative or coherent form that further offers descriptive framework for particular observations and with the help of certain assumptions relevant to explanation follows scores of hypotheses that are tested to gain support or challenge the theory. Theory can also be a body of knowledge not associated with specific explanatory models and theorizing helps develop this body of knowledge [1]. Aristotle contrasted theory with practice and maintained that practice and theory are same as both involve extensive thinking, rather focal aim of both is different, as theoratical deliberation contains abstract and metaphysical notions that are out of the reach of human experience but this theoratical reflection extensively provides intrinsic knowledge needed to establish required framework based upon epistemological foundations [2,3]. In their very fundamental sense, theories are analytical tools for comprehending, clarifying and building expectation about pre-arranged subject matter; Theory is assembled of a set of statements that contain true statements about the subject matter under discussion [4]. Though, the truth of any one of these statements is at all times relative to the whole theory; that is why, often these statements are true referencing one theory but not in the case of another theory. The term theory, as captioned above, drives disagreement among scholars and different schools of social sciences; the prime reason of this disagreement is that theory contains multiple meanings, as detailed above. David McEntire defined theory as ideal or preferred conditions that academics are trying to promote in the world around us [5]. We come across confronting and disturbing circumstances around us that are all the way different from ideal conditioan that we want for us; within the close proximity of emergency management, we want to counter the losses, damages, destructions and disturbances around us and try to improve the post-disaster conditions for a better social setup. Another aspect of theory is the it contains entire body of knowledge, comprehensive set of related concepts, activities and terms that comprise a professional domain [6]. One of the prime and core functions of a theory is to provide concerete academic definitions to clarify related terminologies in terms to express knowledge and information in a precise and meaningful manner; it is necessery to define issues and phenomena with adequacy and accuracy [7]. There has been and there is a constant confusion the way hazard is defined and same as the term disaster. Unless, this confusion about the definition of hazard is over, we cannot come down to clarfiy hazard in its distinct type. Another dimension of a theory is, also paralleled repeatedly to concepts that are empirical devices which qualify understanding. Concepts in their generalized sense create mental imageries of those objects about which people think and talk [8]. In emergency management, the foremost concept of convergence is very significant as resources come from different dimensions and gather on a single point of distribution, it strengthens whole process of post-disaster management and further exemplifies the need of integration among different bodies and authorities best suited to counter the after effects of disaster.

Role of a theory

The foremost question is that, is it necessary for every discipline to own a theory? In the perspective of some arguments given above, it seems that every discipline must contain a well defined, prescribed, comprehensive and concrete body of knowledge for its rational and professional progression. Many disciplines contain central theoratical issues and while keeping focus on these issues, they generate rich

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literature to provide rationale and support in its favor. This theoratical focus helps maintain the boundaries of that discipline and paves the way towards further progression. For last many years, comprehensive emergency management [CEM] has been playing the role of a theoratical model that not only combines all required resources but also provides a clear guideline to be used in case of any emergency and disaster [9]. Although, the framework presented in CEM is widespread and practical but it seems difficult for comprehension and implementation to have a single point of understanding to cover all related aspects of a discipline. In this very regard, we find CEM vulnerable in explaining economic, political and cultural aspects of disaster in real sense of words, that shows its limitation [10]. In order to address this weakness of theory, other relevant perspectives were brought in social construction perspective that is contrary to the technocratic perspective of disaster and presents a different point of view and further clarifies relevant areas. As it is evidently clear that there is no single handed theory available in emergency management but perhaps we can look for a comprehensive theory that covers every associated variable and relevant issue related to disaster; but, again the risk lies in the fact that a comprehensive theory that attempts to explain everything may not explain anything at the end. Therefore, existenece of a theory is valuable or harmful rests on the contribution it makes to the discipline or constraint imposes on the same [11]. Consider the other way around, if we subscribe a single theory for disaster management then it may be useful if it adds value to the discipline by providing furhter directions and meaning or it may be damaging if it confines the flow of information and exchange of knowledge to further strengthens the preponderated proposition [12].

Barricades in Developing a Theory

Even though, it is fairly required to come up with a comprehensive and concrete body of knowledge and develop a theory for disaster management but there are scores of epistemological problems in this very regard that hamper the theoratical development in this area; some of the cores are here as:

Definition of disaster

Disaster, itself is a multifaceted, diverse and complicated phenomenon; it is for sure that exemplification of any specific dimension of disaster is difficult in general circumstances. Disaster tends to expose general population to traumatic conditions and appears as the sole cause for PTSD (post traumatic stress disorder) [13]. Yehuda and Mcfarlane argued against this perception of disaster, the disaster survivors should be viewed as, “psychologically damaged by the experiences that befell them or was it more appropriate to validate the experience of trauma from a humanistic and existential perspective by viewing their responses as an adaptation to frightening environmental events?” [3]. The taxonomy of disaster advocates to evade coinciding and ambiguous terminologies to define natural events as their dissimilar facets may cause multiple psychological reactions [14]. Quarantelli rightfully argues in favor of developig a consensus needed to streamline the definition of disaster as, “unless we clarify and obtain minimum consensus on the defining features per se, we will continue to talk past one another on the characteristics, conditions and consequences of disasters” [15].

Multi-dimensional hazardous exposures

It has had been a matter of great concern that hazard has changed its identification while passing through different chronological phases. The neuclear war between USA and USSR focused atomic explosion as the greatest hazard; industrial explosion and mass scale operational tragedies were the second dimension of hazard; terrorism and anti-social activism turned out to be the latest aspect of hazard. On the contrary, natural hazards are moving along with this known typology. The approach, mechanism, gravity and nature of these hazards are different from one another and we need to frame the commonality in order to derive and define hazard as a socially acceptable phenomenon.

Concept of vulnerability

The prime concept of hazard is complex and intricate and we cannot call an hazard as "disaster in making; if an earthquake hits an isolated desert with no poulation and property then it would not be tagged as disaster" [16]. The magnitude of any disaster is ascertained through the level of vulnerability of the area exposed to a natural phenomenon aka hazard aka disaster. So, it is vulnerability that provides distinction between an hazard and disaster. None of the hazards counter vulnerability but vulnerabnility always counters hazard as it is the state that ensures existense of vulnerability [17]. The question arises here is, are we discussing disasters or vulnerability? As there has been no dictinctive definition of disaster available and it is always defined in the perspective of losses it incurrs and these loses manifest vulnerability.

Emergency management (ambiguities)

The definition of emergency; as defined by Merriam Webster is “an unexpected and usually dangerous situation that calls for immediate action”, is different from definition of disaster and we need to decide, if disaster management is evenly parallel to emergency management. The focus of any emergency is to facilitate and pamper immeidate responders and once the immediate responders come out of the sitautation of threat then the situation of emergency takes a new shape. Whenever we use the term emergency management then it gives us an impression that we possess ability and capacity to control the situation completely that is wrong, in case we refer it to the term disaster. Using emergency and management together is oxymoron and contradictory. An appropriate replacement has not had been found and consistently the same term is being used on large scale.

Question of priorities

Emergency management gives priority to preparedness and response and its sole focus is to be prepared to respond to a disaster [18]. The other focal and considerable areas as mitigation and risk reduction; as once the situation of emergency is subsided and addressed then the next step is to encounter loses and damages to human lives and property. Trendy disasters inform us of the mistakes we have been committing in undertaking disasters in terms of risk management, reduction in pre and post disaster phases.

Vagueness in variables

There are some common factors that are framed with disaster as poor communication, wrong construction, health and safety, over populated areas, hazardous zone identification, in-adequate warning etc. These factors are linked with the damages occurred by natural hazard that eventually turns into a disaster but the corresponding factors as societal and cultural atitudes, buidling construction standards, hazardous zone identification, communication with masses about nature and extent of disaster, socio-political interfaces are neglected. Natural hazards have been listed in the highest category of disasters but on the other hand the theoratical developmend has not had comprised fairly in the conceptual development of a theoratical model.

Contributing disciplines towards emergency management

Geography and sociology are the two key academic disciplines that have so far contributed towards emergency management. Geography provides extensive knowledge about the nature and causes of hazards while sociology contributed towards providing fundamental framework for comprehending social causes and human behaviors during and after disaster [19]. It is to be kept in mind that these two disciplines do not cover all relevant knowledge areas related to disaster as psychological distress, economic impact, financial implications, sociological integration of people at different levels, political intervention, re-structuring and modern technological management. It is for sure that emergency management must not root out its linkage with core disciplines but, at the same time, theoratical advancements should be enriched by incorporating other related disciplines that evenlly supplementing the theoratical growth of the main subject.

Paradigmatic ambiguity

It has been so confusing and ambiguous to unfold the nature and type of paradigm needed to encircle the discipline of disaster management; but over the course of years different paradigms and theoratical perspectives have been undertaken with high hopes to address the needs of the discipline; as Table 1. The conflict amongst imperfect and contradictory paradigms has generated misperception for a discipline that is in compelling need for direction, theoratical underpinnings and conceptual clarity. Above issues have made it crystal clear that academics and practitioners are not on one page when it comes to develop a theory for emergency management. The question here is that why should we look for a theory? The conceptual focus that comes through academia that values research and theory over knowledge and experience and academicians rely upon the knowledge provided by practitioners based upon their exposure and experience of the field. In this very regard, occupational knowledge ascertains the course of action in any such discipline that appears more reliant upon ground reality rather than grounded theory.

Conflicting perspectives hinder theoratical progression

Disaster is a multi-dimensional and very complex phenomenon that undertakes damage, loss, destruction, devastation, hazard and other related prespectives along with it and there is a sharp and clear variation among captioned variables when discussion shifts from collective to individual [20].

- Impact of disaster on a society is all the way different from its impact on an individual [20].
- Impact of disaster on individuals in different parts of the world is all the way different from one another as it goes with core socio-cultural values and other related aspects.
- The sociological impact of disaster on communities and individuals varies from region to region and communities to communities [21].
- The psychological impact of disaster on communities and individuals directly relates to so many indigeneous and ethnic aspects that vary round the globe [22].
- Environmental influence of disaster varies in different regions of the world and its nature is commonly collective as it goes with entire community [23].

Theoratical progression in emergency management revolves around five core dimensions; in order to establish a comprehensive disaster management theory, we need to look into the possibilities that ascertain notion of commonality among these dimensions. The fundamental problem is that there is no commonality among these dimensions. Every region differes from one another in the perspective of these dimensions as:

- Geographical
- Geological
- Sociological
- Psychological
- Environmental.

As mentioned above, the role of the theory is to maintain a well knitted knowledge flow within its prescribed scope of work; the body of knowledge surrounds a theory is needed to frame upon definitie variables that provide extensive workable grounds to gain progress in respective area. In order to comprehend the disimilarities among these core dimensions, we need to review them individually that further establishes a knowledge based scholarship surrounding the physical and meta-physical differences that hinder common theoratical development in the field of emergency management.

Geographical dissamilarities

Geography divides different areas into regions on the basis of physical characteristics [24]; physical geography is one of the major sub-fields of geography (natural science) that deals with the intricacies, patterns and processes of natural environment [25]. It is for sure that every region of the the universe maintains diverse physical geography. It relates with five core themes of geography as:

- Location {where is it located}
- Place {where's it like there}
- Human/Environment interaction {what is the relationship between human and environment}
- Movement {How and why places are connected with one another}

Washington State Legislature {Comprehensive Emergency Management}	preparation for and carrying out all emergency functions, other than functions for which the military forces are primarily responsible, to mitigate, prepare for, respond to, and recover from emergencies and disasters, and to aid victims suffering from injury or damage, resulting from disasters caused by all hazards, whether natural, technological, or human, and to provide support for search and rescue operations for persons and property in distress. (WSL)
Armstrong and Don Geis {Disaster resistent community}	Prepared to counter and confront a natural disaster that can influence entire community with little warning. (Armstrong, Geis)
Britton and Clarke, Burby et al., Buckle et al. {Resilience}	The capacity to prevent or mitigate loses and then secondly if damages occur to maintain normal living conditions and thirdly to manage recovery from impact (Britton; Burby; Buckle).
Boullé et al.; Berke et al.; and Mileti {Sustainability}	Sustainable hazards mitigation is the ability to endure and maintain at the time of natural disaster in order to bring back normalcy within shortest possible time without losing sociological and psychological grounds (Boullé; Berke; Mileti)

Table 1: Perspectives and Paradigms.

- Regions {How and why is one area similar to another} (https://www.csustan.edu).

In the perspective of five core themes of geography, we review the course of human geography that deals with the universal domain, its populace and their societies, values, frugalities and communication with the environment by giving emphasis to their relationships with and through space and place [26]. Impact of disaster carries forward in any region of the world under the viewpoint of human geography and these impacts varies from region to region as level of vulnerability and risk is closely related to human geography [27]. Further, the environmental geography exhibits multi-dimensional relationship between human and their natural environment; this interaction varies from region to region and it is difficult to find fundamental commonality among this interaction in different societies and places round the globe.

Geological dissimilarities

Geology is earth science that deals with the study of solid earth, the rocks in it and the process of change that takes place over a period of time; it further provides insight into the history of earth and establishes basic evidence for evolution of life, previous climatic existenses and changes [28,29]. Most of the hazardous processes are geological processes and they occur differently in different regions of the world; eartquake, volcano, landslide, tsunami, flood, drought, hurricane, tornado etc. are varied geological processes [30]. Regional geology further exemplifies that different and multiple geological disciplines are integrated to study the geological nature, process and complexity of specific region [31]. The holistic size and edges of any region are demarcated by geologically significant boundaries and the manifestation of geological progressions.

Sociological Dissimilarities. Sociology of disaster is a sub branch of sociology, it does not only include the impact of disaster on regional level but also undertakes the catestrophic impact on macro level [32]. The identification of {PTSD} Post Traumatic Stress Disorder, dejection and nervousness, fear syndromes, and other mental disorders amongst the victims contrast depending upon social, cultural and economic aspects [33]. The concept of social vulnerability moves along disaster sociology; it refers to the incompetence of individuals, organizations, and cultures to endure hostile effects from numerous stimuli cause stress to which they are exposed. These impacts relate and depend upon fundamental characteristics in-built in social exchanges, associations, and systems of cultural tenets [34]. The prime concept of social vulnerability, in the perspective of natural disasters surfaced in 1970s, by O´Keefe, Westgate and Wisner; they clarified that most of the disasters were not caused by nature but due to socio economic disturbances, imbalances and related conditions [35]. The empirical data presented in their research further manifests that natural disasters increased in last 50 years and even the loss of precious human lives and most of these disasters concentrated in uder-developed countries where vulnerability was on the rise. Integration and conflict between culture and nature generates nature-culture dichotomy; O'liver Smith enfolds people-environment relationship in connection with two definite veriables as cultural construction and physical fabrication of those circumstances that accelerates possibility of disaster [36]. Cultural variations and social peculiarities are common to every region and we cannot generalize the conceptual notions of sociological aspects on universal poster, in order to assemble a universal philosophical scholarship regarding social manifestation of human and environemental interaction.

Psychological dissimilarities

Disasters are traumatic events result in a varied array of mental and physical strength disorders [37]. Post traumatic stress disorder (PTSD) is the most commonly researched and studied phenomenon that occurs after every disaster and distressing event [38]. Disasters are large scale traumatic events that involve millions of people and frequently accompanied by economic destitution, financial distress and property damages [39]. Epidemiological viewpoint clarifies that the impact of disaster never remains the same, even if the nature of disaster is similar; post disaster epidemeology discusses the complications involved in post disaster influence. Impact of disaster varies from individual to many and many to individual, even in a single disastrous event; not to talk of physical loses as they occur jointly but the complexity of psychological impact seems different from physical damages [40,41]. Natural disasters are not only more frequent in developing countries but also contain large scale devastating impact on economy as well as individuals' mental health. There are number of causes related to this discourse as poor planning, delayed warning, inadequate emergency preparedness and insufficient mitigation measures [42]. Number of pre-disaster factors (poor living condition, population planning, economic in-equality, housing infrastructure etc.) add more fuel to fire. Cultural diversity is very significant when it comes to post disaster stress, resilience and personal configuration [43]. These factors also upset the frequency of psychiatric illness after disasters. Bearing in mind the aforementioned aspects, it is anticipated that there would be vital variances in post-disaster mental health in diverse cultures. There is a pressing need to increase mental health awareness, expressly in the more vulnerable emerging/developing countries. The World Health Organization {WHO} proposes that it is imperious to undertake wide-ranging research on the population of developing countries that are exposed to natural and man-made disasters. Psychological Impact of disaster are aggravated by number of social factors comprising magnitude of damages, ineffectiveness of responses, time required to return to normal life and pre-disaster existing vulnerability [39]. The Psychological influence of disaster directly relates to core social factors that vary from society to society; for instance, many communities continue living in hazard prone areas; even they know the magnitude and frequency of risk being there [44]. In Pakistan, millions of people have been living in eartquake exposed areas, even after multiple damages and huge financial loses, they are not ready to leave these areas as they have ancestoral attachement with these localities, same is the case of Bangladesh, where millions of people are forced to live near rivers as they do not have any other means to earn their livelihood, it leaves them more vulnerable to flood related damages every year in monsoon [45,46]. Furthermore, there are scores of other factors that vary from commune to commune as life style variations, demographic disparities and political interests [47]. Cultural contexts can also be considered in order to assess vulnerability relevant to psychological impact of disaster [48]. Universal perception, preparedness, response to disaster, rehabilitation and reconstruction initiatives depend upon cultural background of affected societies and it is difficult to find any commonality between two societies, even if the nature and magnitude of disaster seems same [49].

Environmental dissimilarities

Environment as defined is "the aggregate of social and cultural conditions that influence the life of an individual or community"; these environment or environmental conditions vary from society to society and region to region and it is improbable to generalize its characteristics in one way or other. Environment is a multi-dimensional phenomenon

and environmental impact of disaster undertakes social {demographic, economic, political and psychological} facet of environment, An enhanced understanding of disasters' social effects can offer a foundation for pre-impact forecast and the advance of contingency plans to avert adversative consequences from happening [32].

Environmental disruption caused by natural disaster varies from region to region; it has been observed that under-developed and developing economies are more vulnerable to disasters, the magnitude and quantum of loses in developing societies seem far greater than industrialized countries [34]. Ferrier and Spickett in their research article mentioned that inadequate supply of utilities and scanty heatlh/hygeine services have underscored the lives of billions of people in under developed and developing countries. In one of its reports, World Bank assesses that almost 90% population, of countries like Nepal, Bangladesh, Burundi, Taiwan, Honduras, El-Salvador, Malawi, Haiti, the Dominican Republic etc., live in areas at high relative risk of death from two or more hazards [50]. Associated factors, like poor governance, economic sanctions, poverty and momentous foreign debt, force farmers to burn wood and charcoal for fuel and to engage in unsustainable farming techniques which drive deforestation, the consequences of which are multiple and never ending disasters [51].

Conceptual Foundations Needed to Develop Emergency Management Theory

The complex issue of developing a comprehensive 'emergency management theory' is fairly a difficult task, that needs extensive review of past scholarships and rapidly changing new trends that provide foundational basis for emerging challenges; needed to be addressed through a theory incorporating the requirements of emergency mnagement discipline. Claire Rubin asserted in one of her articles that we need to bring modernity in emergency management but not at the cost of re-founding the foundations [52]. It shows that past efforts undertaken by scholars and practitioners are to be taken into consideration in order to come up with a complete, multi-dimensional and practical theoratical framework. Scholarly steps towards building a theory must take into account the terms as 'hazard, disaster, emergency, convergence' from previous researches in this discipline; furthermore, in order to address the complexity and intricacy of modern disasters, new terms as 'sustainibility, resilience, compound disaster' can be added to enrich theoratical framework. In addition to it, Emergency management theory should undertake principles as disaster prevention, preparedness and improvisation into account [53,54]. These additions should further be accumulated with proven frameworks and models of decision making (rational, bureaucratic, group think etc.) as they pave the way towards comprehending organizational dynamics and policy making structure. Another significant aspect to be considered in developing a disaster management theory is to establish a commonly accpeted definition of disaster. McEntire defined disaster as "disasters are the disruptive and/or deadly and destructive outcome or result of physical or human induced triggering agents; when they interact with, and are exacerbated by vulnerabilities from diverse but overlapping environments [5]." It is quite probable that we may not be able to gain consensus on this definition but continuous efforts must be made to form a full fledged definition of disaster that covers sociological, physiological and environmental aspects. Taxonomy and typology of different types of hazard is another important area that is to be taken into close consideration. Currently, number of emergency management frameworks are implying focus on specific type of hazard in particular atmospheric conditions. The need is to develop a comprehnsive theoratical structure that helps encountering varied types of disasters; especially, the notion of non-linearity attached to a disasterous situation [55]. It is required to frame a multi-causal view of disaster coupled with appreciating the complexity involved in emergency management. As, there are large number of variables to be studied and considered, that is why; it seems advisable to use process theory, Goal Setting theory and chaos theory to ensure proper guidance for research and broader understanding of phenomenon of disaster [56-58]. Disaster is a discipline that contains many inter-connected and inter-dependent variables and a comprehensive, holistic approach is required to adquately address and establish working relationships among these variables. Immediate need is to re-shape overall appearance of emergency management as in most parts of the world, emergency and disaster management is considered isolated and instead of having this discipline under the fold of socio-cultural vlaues. The need is to change general attitude that emergency management is needed in case of emergencies and disasters; close coordination, cooperation, integration and consistent communication among governmental, non-governamental and NGO secotrs including practitioners, scholars and researchers so that every one seems on board to link emergency management with core societal quarters. Concept of networking and integration would surface the way towards developing a multi-dimensional, applied and wide spread. Theoratical configuration and knowledge based scholarships in disaster management is not an easy task and the core reason is its variablity and un-predictability [59].

Philosophical underpinnings

It has earlier been discussed that conceptual and philosophical depth of emergency management is comparatively lean as it is more applied an area. Even though, there are certain philosophical scholarships that are to be considered while thinking of developing a knowledge based theoratical framework in emergency management. It is worth considering that varied concepts are associated with disaster and vulnerability.

Interpretivism

The concept of disaster and vulnerability cannot be understood in the perspective of scientific investigations and empirical evidence; as manifested by inter-pretivism that social phenomena may not be subject to scientific investigations as natural phenomena, the epistemology of social phenomena is all the way different as it goes beyond scientific investigation and empiricism [60]. Disaster and vulnerability are inter-related concepts and these cannot be investigated through any empirical method. Both of these concepts complement one another and their core definitions cannot be generalized.

Social economist

Economic in-equality and class difference in a society push poor, helpless and under-privileged clusters to live in pathetic conditions. Minorities, deprived and financially un-stable classes in an economy are exposed to dangerous living circumstances. These clusters and classes are least likely to deal with harsh natural phenomena as earthquakes, tornadoes, floods etc. Especially, in under-developed societies, the micro and macro concepts of disaster and vulnerability are ambiguous and controversial.

Constructivism

Constructivist came up with altogether a novel epistemological posture that exhibited the nature of meaning as produced by humans, out of close and persistent interaction between their experiences and ideas [61]. Jean Piaget made it clear that individual development of

a human is based upon his personal interaction with environment and nature, contrary to the influence by other individuals [62]. It is the core reason that concepts of disaster and vulnerability cannot be generalized as it varies from individual to individual. Different classes and clusters in a society share different living conditions and economic cultures; these personal experiences alter the way an individual frame the meaning of external variables.

Structuralism

Structuralism demonstrates that elements of human culture can only be understood in the light of a bigger, all-encompassing structure that shapes social environment and oversees cultural values; comprehension of different phenomena of human life is possible only if we closely look into their inter-relatedness, this inter-relatedness creates an abstract culture that further undertakes the social culture [63]. Disaster and vulnerability are inter-related social phenomena and these can only be comprehend through social structure that shapes the visible and invisible configuration of a society. It is to be kept in mind that cultural variations re-shape the meanings of many concepts and transform them into specific phenomenon as compared to a generalized one.

Sociological Underpinnings

In addition to above captioned philosophical underpinnings, there are scores of sociological underpinnings to be taken under close consideration while working upon framing a knowledge based scholarship referencing disaster management.

Technological advancements

Modern technological influxes have altered the way of living; computers, information-communication technologies (ICTs) and other related interfaces increase the level of sensitization. It is for sure that extensive use of these technologies has provided new possibilities to mitigate vulnerability while on the other hand generation of excessive heat also influences environmental infrastructure that adds further misery.

Behavioral modification

Social classes and class difference that en-route through economic in-equality; most of the universal societies are struggling to generate internal uniformity with the help of which social balance can be obtained. People living in divergent social quarters exhibit conflicting behaviors. Disaster and vulnerability are relative terms and people in different classes exhibit their behaviors with reference to their level of risk against these terms. In developing countries, this difference is rather more significant as compared to developed countries and it is to be addressed by incorporating concerns of every class in an integrated manner.

Social connections

It has been mentioned at many places within this paper that effective disaster management needs extensive cooperation and collaboration among involved organizations (public and private). It is needed to have a comprehensive social network to counter the disaster caused by natural phenomena. In most of the cases, this coordination seems missing and lack of coordination further aggravate and piles up the losses. Societies are transforming and taking the shape of open system that energizes a social setup, especially, at difficult times. Any theory development process is required to look into this relationship that convert collection into connection.

How to counter above challenges

Careful review, of the discussion undertaken so far, clarifies that (1) we have appraised the barricades hindering theoretical progression and (2) further highlighted some of the relevant topics that should be encompassed in any/all future research initiatives covering theory development. Covering captioned areas does not provide any extensive dimension that may help disaster researchers and scholars in overpowering these complications. Few recommendations are hereby forwarded in terms to bring improvement in the process of theoretical progression in emergency management.

Critical thinking (analysis)

Scholars and practitioners in the field of disaster management need to change their thinking paradigm and it seems significantly imperative to think critically and establish analytical framework to move further. For instance, the field of disaster management does not allow going extensively pro-active as bounded limitations are there and we need to move with great care, being within limits, to device effective disaster prevention theory. The process of critical thinking ensures that our ideas are reasoned, well-judged and rational. We cannot do anything with the piles of loses in every disaster and on the other hand we are not in a position to present any novel idea for their mitigation. But, at the same time, we need to gear up to response public plea in case of disaster through recovery and relief operations. It clearly shows that we are in a flux of openness and closeness both and we do not have the privilege to device any ideal theory favoring chosen circumstances. Every emergency management theory is to be formed keeping in view the corresponding limitations.

Realistic attitude (approach)

Along with critical thinking, it is equally significant that scholars should adopt a realistic approach based upon real life scenarios and general conditions and truthful perspective so that Policy and planning guidelines would be attainable. If the thinking paradigm and theoretical perspective are based upon false and misleading assumption then eventually, the end result or outcome will be false and misleading too. While grounding our premises on reality would pave the way towards forming practicable theories with pragmatic applications. This discussion further clarifies that false and faulty assumptions pose as barrier in the process of change and it is another task of a theorist to foresee the fundamental distinctiveness in ideas/concepts/physical objects in order to recognize and identify actual resources involved in the process of theoretical development.

Multi Dimensionality in Conceptualizing Vulnerability

Inspiring usefulness of the concept of vulnerability provide extensive options to scholars and practitioners to bring substantial advancement in emergency management theory; as discussed earlier in different sections of the paper that the core problem in progressing towards establishing disaster management theory is non-availability of generalizable variables. In this very context vulnerability is the only variable that seems under human control, it is the only variable in the equation of disaster management which helps us understand the intrinsic nature of disaster along with its relevant intricacies. Vulnerability is weakened capability of an individual or group to antedate, deal with, repel and recover from the impression of a natural or man-made threat; the notion is comparative and vibrant. There is a straight, significant and sharp relationship between vulnerability, resilience and resistance; as their inter-relatedness describes disaster in its multi-dimensionality; holistic social conditions and their interaction

with environmental forces generates disasters and by reviewing these two variables, we can better comprehend vulnerability in a futuristic manner [64]. Above mentioned five core dissimilarites (geographical, geological, psychological, sociological, environmental) coupled with economics can even provide a broader spectrum to study vulnerability and its relatedness with emergency management theory.

Geographical vulnerability

Geography is a field of science that studies land, topographies, natives and phenomena of earth; it furthers the study of human-land relationship, earth science and place/region studies [65]. Human geography and physical geography are two sub-branches of geography. In this very regard, human geography studies people in relation with their communities, economies and cultures in close interaction with collective environment [66]. Human geography comprises of captioned variables and by developing concrete theoretical frame work, human geographical vulnerabilities can be addressed.

Geological vulnerability

Geology studies solid earth including the rock of which the earth composed. Well planned and rapidly growing urbanization round the globe has made it easier to study the geological foundation of most of the cities. Geotechnical engineering easily materializes seismic vulnerability of a city by assimilating seismic hazards over the constructed environment and substructure information. The comprehensive geological and geotechnical study of any area enables earth quake planning and emergency preparedness in a proactive and planned manner [67].

Sociological vulnerability

Sociology encircles studying a society or holistic social behavior that comprises of its institutions, networks, overall development and related organizations; critical analysis and empirical investigations are some of the methods used to study social behaviors [68]. Socities round the globe have commonalities that share above variables; although, there is a lot of variations when we travel from culture to culture and society to socisty but there are even some fundamental variables that remain static. Sociological vulnerability can be studied through social structure. Socially vulnerable societies consist of weak social institutions and social structure. If we establish a taxonomy of fundamental variables in sociology then the notion of generalizability can be well addressed and theoriatical progression can be excelled.

Psychological vulnerability

Psychology studies human behavior and human mind, it further analyzes individual and general perspective of a society by implying empirical and rational means [69]. Individuals and societies are different from one another on micro and macro levels asdescribed above under five basic dissimilarities; eventhough, individual vulnerability and social vulnerability varied from one society to another. Individual's psychology and social psychology differs from one another buther fundamental variables encircle individual's personality and scoial infrastrucure are more or less same [70]. Keeping these basic variables in mind, researcher can strive to unfold intricacies involved in generalizing psychological variables. We need to very carefully establish the border line of common social behavior, once this initial repository is established then theoratical advancement can be forwarded and empirical investigations be used to prove the commonality between two different societies.

Environmental vulnerability

Environment comprises of number of social factors and the notion of vulnerability stresses the social physiognomies and conformations used by societies to counter the dares of physical environment [71]. Environmental vulnerability is frequently implied in either a physical situation (delicate or flimsy) environments and ecologies, or (fundamental operational progressions) that incline people to undesirable concerns of environmental alteration. It encircles socio-economic, cultural, political and ecological dimensions within a social sphere. It is clear that all social setups round the globe differentiate among one another with respect to above mentioned dimensions of environment but a fundamental commonality may be traced up to some extent that can be helpful to establish theoretical foundations respecting environment. The notion of vulnerability with reference to environment depends upon the concreteness of the environmental foundations of any/every society.

Conclusion

Holistic approach towards concept of vulnerability justifies that we are trying to undertake a comprehensive emergency management approach towards disaster management. Furthermore, vulnerability takes along resistance and resilience and paves the way towards developing a comprehensive mechanism that advocates safer atmosphere for all communities. The notion of risk is interchangeably linked with the notion of vulnerability as these both complement one another; as more vulnerable conditions opt for more risk on their part in terms of any natural or manmade hazard [72]. The fundamentaly conceptual and methodological review of vulnerability requires scores of methods to measure the extent and nature of vulnerability as {indicators, participatory method, scaling method etc.} [73]. It is significant and interesting as well that the concept of vulnerability has so far contributed in all aspects of disaster and emergency management studies. Extensive research initiatives are being undertaken to re-define vulnerability or reform the definitionof vulnerability and formulize its assessment and measurement methods that can help researchers towards decision making [74-77].

Many researchers and scholars have come up with novel dimensions of vulnerability that further streamline the concept and links it with core methodology of disaster and emergency management [78-82]. Clinical psychology exemplifies the cogitive dimension of vulnerability and relate it to the typography of people that some people appear more vulnerble in a disasterous condition as compared to other people?; emotional vulnerability describes that people carry individual emotional indices and it is evident that same event influences people differently as more emotionaly charged people appear more vulnerable as they take deep impact of any sudden change [83,84]. There are other dimensions of vulnerability that makes it easier to focus the notion and derive a concerete knowledge based scholarship [85,86].

Endnote

This paper is an initial attempt towards developing knowledge based theoretical framework in the field of emergency management. Philosophical and sociological underpinnings are the novel area that has been taken into prime considerations coupled with five core dissimilarities that further clarified the issues and problems to be studied keenly before attempting towards establishing any comprehensive body of knowledge.

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