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Identification of Disaster Knowledge factors: preliminary findings

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Abstract

Disasters bring about the loss of lives, property, employment and damage to the physical infrastructure and the environment. The number of reported disasters has increased steadily over the past century and risen very sharply during the past decade. While knowledge management can enhance the process of disaster management, there is a perceived gap in information coordination and sharing within the context of disaster management. Identification of key disaster knowledge factors will be an enabler to manage disasters successfully. The study aims to identify and map key disaster knowledge success factors for managing disasters successfully through capturing the good practices and lessons learned. The objective of this paper is to present the interview findings on influence level of disaster knowledge factors in managing disasters successfully and the means they influence throughout the disaster management cycle. While all the respondents agreed that the influence level of social factors in managing disasters is very high, a number of respondents agreed that the influence level of technological factors is significant. Operational/managerial, economic and technological factors seem to influence the whole disaster management cycle including mitigation/preparedness, immediate relief and reconstruction/recovery.

Key Words: Disasters, Disaster management cycle, Disaster knowledge factors, Level of influence, Way of influence,

1 Introduction

Disasters cause huge impact on people, property and environment. On December 2004, a massive earthquake of magnitude 9.0 struck the coastal area of northern Sumatra in Indonesia and this triggered tsunami that affected Indonesia, Thailand, Sri Lanka, India, Maldives, Bangladesh, Malaysia,

Myanmar and Somalia (Pheng *et al.*, 2006; Sonak *et al.*, 2008; Srinivas and Nakagawa, 2008). Hurricane Katrina was another large natural disaster which caused extensive human suffering and physical damage (Koria, 2009). Recent Haiti earthquake counts as another deadliest earthquake. As worldwide communities have been facing an increasing frequency and variety of disasters which can cause direct and indirect effects (Oloruntoba, 2005; Kovacs and Spens, 2007; Moe *et al.*, 2007) the urgent need to reduce disaster risk (Moe *et al.*, 2007) and develop a resilient community capable of recovering from disasters (Rotimi *et al.*, 2009) are of increasing concern in many countries.

Though there is no way of neutralizing all negative impacts resulted from disasters, efforts can be made in order to reduce their impacts. In this context, knowledge management can play a vital role through ensuring the availability and accessibility of accurate and reliable disaster risk information when required and through effective lessons learning. Despite this, knowledge on disaster management strategies appears fragmented, emphasising a perceived gap in information coordination and sharing (Mohanty *et al.*, 2006; Pathirage *et al*, 2009). Accordingly, the knowledge and experiences of disaster practitioners are remaining in individual or institutional domain. As an example, a case study conducted in Sri Lanka, revealed that the organisations have not been able to capture, retain and/or re-sue the learning from similar operations except through the tacit knowledge of individuals that have worked in various operations (Koria, 2009). Therefore the lack of effective information and knowledge sharing, and knowledge creation on disaster management strategies can thereby be identified as one of major reasons behind the unsatisfactory performance levels of current disaster management practices.

This research aims to identify and map key disaster knowledge factors in managing disasters through good practices and lessons learned and to enhance the knowledge on disaster management. Within this study, this paper presents the interview findings on influence level of disaster knowledge factors in managing disasters successfully and the way they influence throughout the disaster management cycle. Paper organised into 6 sections. Section 1 is the introduction. Section 2 provides an introduction to disaster knowledge factors based on a comprehensive literature review followed by the methodology in section 3. Section 4 provides the interview findings and analysis on influence level of disaster knowledge factors in managing disasters successfully and the way they influence throughout the disaster management cycle followed by the summary in section 5. The way forward is provided at the end of the paper.

2 Disaster knowledge factors: literature review

Disaster management efforts aim to reduce or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery (Warfield, 2004). The disaster management cycle illustrates the ongoing process by which governments,

businesses and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. There are essentially three phases in which disaster management efforts could make contributions: disaster mitigation or preparedness, the immediate aftermath or relief and the reconstruction/rehabilitation phase.

Mitigation or risk reduction activities include structural and non-structural measure undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards (Atmanand, 2003; Bosher *et al.*, 2007; Moe *et al.*, 2007; RICS *et al.*, 2009). Preparedness dealing with the activities an measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary evacuation of people and property from threatened locations (Atmanand, 2003; Moe *et al.*, 2007). Provision of assistance or intervention during or after a disaster to meet the life preservation and basic subsistence needs of those people affected is made during the relief phase (Moe *et al.*, 2007). Reconstruction refers to the rebuilding of damaged living conditions of the stricken community with the aim of long term sustainability (Moe *et al.*, 2007). The commencement of the recovery phase begins with the restoration of essential buildings and infrastructure services destroyed in the disaster and rehabilitation to assist the victims in returning to their pre-disaster livelihood (Pheng *et al.*, 2006) or until the community's capacity for self-help has been restored (Rotimi *et al.*, 2009).

Factors to be considered in managing disasters can be broadly classified into several categories as; Technological, Social, Environmental, Legal, Economical, Functional, Institutional and Political based on their characteristics. These factors are common for all types of disasters, three phases of the disaster cycle and many countries affected.

Technological factors include any tool, technique, product, process and method to benefit disaster management. Under this main category, three sub-categories can be identified as warning systems, communication systems and structural measures. Tsunami early recovery systems come under the warning systems. Recent Indian Ocean tsunami has made people aware of the lack of tsunami early warning system (Camilleri, 2006; Moe and Pathranarakul, 2006). Integration of warning systems with communication, education and awareness raising of the population is also important (Rodriguez *et al.*, 2006). Communication systems include emergency public sirens, satellite images, geographic information systems, remote sensing tools and broadcasts using radios, televisions and print media. These are used to distribute information and to make people aware on how to evacuate, locate and relocate (Oloruntoba, 2005). Structural measures include the effective application of science and engineering principles for the development of built environment. Physical preventive measures, physical coping measures and construction of resilient buildings and structures are considered under structural measures (DFID, 2005).

Aspects relating to human society and its members in managing disasters are included under social factors. Initiatives to increase the population's level of education, increasing employment opportunity, reducing poverty, enhancing the role and participation in decision making, including women, would support preparing for future disasters (Rodriguez *et al.*, 2006). Natural environmental factors in related to the disaster management are included under environmental factors. The importance of maintaining protective features of the natural environment such as sand dunes, forests and vegetated areas are highlighted by many authors (Arya *et al.*, 2006; Bosher *et al.*, 2007).

Legal factors include aspects relating to law, accepted rules, regulations in managing disasters. According to Moe and Pathranarakul (2006), disaster management supporting laws and regulations must be established and enforced so as to create an enabling environment. Suitable laws and regulations can be enacted based on professional hazard and vulnerability assessment. However, the process of getting building consent, lax building codes, weak enforcement of construction standards and corrupt procurement practices are some of the lacking areas identified under this classification (Pheng *et al.*, 2006).

Long term economic planning measures and financial factors are included under economic factors. Economic planning measures include aspects relating to production, distribution and consumption of goods and services in a society. Aspects relating to money and management of monitory assets are covered under financial factors. Taking necessary measures to protect agricultural sector (Jayaraj, 2007), industrial sector and infrastructure system (Bosher *et al.*, 2007) are few examples for economic planning measures. Insurance of properties against disasters is another initiative to survive after disasters (Atmanand, 2003). This will indirectly ensure the quality of construction as insurance companies will insists on certain minimum standards being met. Finance is an essential resource in disaster management and financial policies and procedures have an effect on disaster management process.

Operational/managerial factors include planning, coordination and management of disaster related activities. Skills and competencies needed to accomplish desired works are also included under this classification. Logistics management, information and communication management and leadership are some of the aspects covered under this category. Inadequate planning, lack of resources (Rotimi et al., 2009) and lack of experienced staff (Koria, 2009) hamper successful reconstruction. Challenges of disaster logistics (Kovacs and Spens, 2007), insufficient coordination between international, national, regional, organisational and project participants (Oloruntoba, 2005), ineffective information management (Sobel and Leeson, 2007) and inaccurate decision making appear to hinder the effective disaster management.

Institutional factors include the aspects relating to an organisation founded and dedicated to disaster management and related activities. An effective institutional arrangement is essential for managing disasters successfully. Development of land use plans and regulations (Srinivas and Nakagawa, 2008), building codes (Bosher *et al.*, 2007), enhancing disaster related knowledge and competencies come under this category. Political factors include the aspects related to politics in relation to disaster management. In Sri Lanka it is found that the internal political agendas superseded the technical agenda contributing to additional delays in reconstruction work (Koria, 2009).

3 Methodology

In view of addressing the perceived need to share knowledge relating to disaster management strategies, the School of the Built Environment, at the University of Salford, undertook the research project 'ISLAND' (Inspiring Sri- Lankan renewal and Development) in 2006, partly funded by the RICS Education Trust. The research aimed at increasing the effectiveness of disaster management by facilitating the sharing of appropriate knowledge and good practices in land, property and construction. Due to the broad scope of disaster-management related activities, this initial research focused on creating a knowledgebase on the post-tsunami response, with specific reference to case material in Sri Lanka. Subsequently, the database structure for sharing and disseminating knowledge on disaster mitigation strategies was finalised (please visit http://verber.buhu.salford.ac.uk/island/project,php). Based on the themes identified in the database structure, relevant government authorities, funding and professional bodies and research groups were approached for empirical data and collection of case study material in Sri Lanka.

In this context, research proposed through ISLAND-II is aimed at further extending the scope of ISLAND, by incorporating appropriate knowledge and good practices relating to the three key phases/stages of knowledge capturing within the disaster management cycle, namely: mitigation/ preparedness, relief/recovery and reconstruction/rehabilitation. The research project is carried out according to four work packages (WPs) and this paper is based on WP 2 which attempts to identify key disaster knowledge factors within the disaster management cycle. Based on this, a knowledge map highlighting key factors relating to disaster management cycle will be delivered.

Identification of key success factors within the disaster management cycle will be delivered based on interviews with experts who are involved in disaster management process and supported by an extensive questionnaire survey. Objective of this paper is to present the interview findings on the level of influence of disaster knowledge factors in managing disasters successfully and how these factors influence the disaster management cycle. A comprehensive literature survey and review is first carried

out to identify the disaster knowledge factors which support successful disaster management and based on these findings semi-structured interviews are conducted with disaster management experts.

4 Interview findings and analysis

This section provides the preliminary findings and analysis on influence of disaster knowledge factors in managing disasters successfully and how they influence on different phases of the disaster management cycle.

4.1 Profile of the interviewee

Influence of the disaster knowledge success factors in managing disasters successfully and how they influence on different phases of the disaster management cycle are identified based on interviews with experts involved in disaster management process. Table 1 provides the profile of the experts, interviewed for this research.

Table 1: Profile of the experts

Interviewee Profile	Interviewee A	Interviewee B	Interviewee C	Interviewee D	Interviewee E
Age range	41-50	31-40	31-40	31-40	31-40
Gender	Male	Male	Male	Male	Male
Experience in dealing with disaster issues	4	7 (Research)	4	4	4 (Research)
Types of disasters dealt with	Flood Railway	Tsunami Hurricane	Hurricane Outbreaks	Flood	Earthquakes
Disaster related training programmes undergone	Literal raining in terms of CPD workshops	-	-	First aid, coordination	Simulation

4.2 The level of influence of disaster knowledge factors in managing disasters successfully

Interviewees were asked to rank the influence level of disaster knowledge factors on managing disasters successfully. A scale of very low to very high was used to measure the level of influence of disaster knowledge factors in managing disasters and results are summarised in Table 2.

Table 2: Influence level of disaster knowledge factors in managing disasters successfully

Disaster knowledge factors	Level of influence marked by each interviewee				
	Interviewee A	Interviewee B	Interviewee C	Interviewee D	Interviewee E
Technological factors	H	VH	VH	VH	VH
Social factors	VH	VH	VH	VH	VH
Environmental factors	H/ VH	N	H	VH	H

Legal factors	H	H	VH	H	VH
Economic factors	VH	H	VH	VH	H
Operational/ managerial factors	VH	H	VH	VH	H
Institutional factors	VH	H	VH	VH	VH
Political factors	V	VH	-	N	VH

VL=Very Low, L=Low, N=Neither, H=High, VH=Very High V= Variable

4.2.1 Influence level of technological factors

According to Table 2, a significant number of respondents agreed that the influence level of technological factors in managing disaster successfully is very high. They argue that the role of technology spans from preparedness to reconstruction by covering the whole spectrum. Accordingly, at any part of the disaster management cycle there is a high level of technological involvement. As an example, in preparedness stage, most of measures that a country takes to avoid disasters are technology driven/ based. These include early detection systems, warning systems and building dams etc. Furthermore, in immediate relief stage, speed is of essence to save the lives of people being affected. This is often referred to as a golden hour and it is essential to rely on good technology. For example in 2005 Kashmir earthquake, government turned out the scale of the disaster only after a day and by that time most of people were already dead. So the speed of communication is absolutely critical and technology plays a vital role in it.

However, it is emphasised the fact that there must be a contextualisation and match in want to the other. Which means it is required to match a particular technology to a particular type of disaster to find out how successful it might be. For example the technology that works in fire, may not be that successful in flooding. Similarly the technology which applies to massive scale of disaster may not applicable to small scale disasters.

4.2.2 Influence level of social factors

As indicates in Table 2, all the respondents agree that the influence level of social factors in managing disasters is very high. They argue that the end results of managing disaster will have to be useful to the community and if they are not taken seriously, then there is no point of doing the disaster management in the first instance. Eventually, the technology is just going to give the information but it would be human beings who will have to react in most cases. Therefore, it is required for human beings to interact closely with each other in order to react and respond to disasters. As an example, if people are trained about a particular issue, it increases their awareness and they will be more ready to appreciate what they need to do to reduce the consequences, to understand how to deal with such issues if it does happen, and they will be more robust to relieve and come out of it. Hence, social factors are given very high rank by the respondents. However, it is highlighted the fact that the extent to which they

influence is not the same as there may be subtleties in these social factors and each one is acting not in the same way.

4.2.3 Influence level of environmental factors

As illustrated in Table 2, majority of respondents agreed that the influence level of environmental factors is high. However, they argued that while natural factors can sometimes prevent disasters sometimes they promote disasters. For example Rathnapura district in Sri Lanka gets flooded due to its natural position. It also at the south west face of the hill country which exposes to a lot of rain and in addition to that several rivers flow through Rathnapura, particularly the Kalu Ganga, which is the fastest river in Sri Lanka. Therefore, Rathnapura is affected by all these natural factors. On the other hand, Yala and Bundala national parks and some of the areas of Hambanthota in Sri Lanka are protected from tsunami due to the natural vegetation and mangroves. Though they rank it as very high or high, respondents emphasized the fact that the answer is contingent upon the context. One argued that while people can benefit from natural environmental factors in managing disasters there are instances where people do not simply have access to natural protection. However, it is required to exercise the same care when dealing with two types of situations. It is argued that there isn't much influence when it is come to the environmental factors and ranked as neither.

4.2.4 Influence level of legal factors

Legal factors are ranked as high by the majority of respondents. As laws make people legally binding or things compulsory to follow, laws safeguard everybody's interest and larger community. Therefore, respondents considered legal factors to have high influence in managing disasters successfully. Also it is made a point that laws do not seem to impact so much on human behaviours like bribery and corruption and these behaviours appear to be more powerful and accepted in a community. Therefore, though legal influence looks good and simple on paper, in real life there is an extent to which the legal structures can play its role as issues are socially embedded, contextual and multifaceted.

4.2.5 Influence level of economic factors

As per the Table 2, majority of respondents agreed that the influence level of economic planning measures and financial factors in managing disasters successfully is very high. According to the respondents' views, long term economic planning and finance have an influence on the measures or the strategies to build community resilient or to take preventive measures. In that sense though people have brilliant strategies for disaster management, if they are not equipped with proper economic plan and finance, then there will be limited resources to get the plans implemented. As an example, agricultural planning measures would ensure that there is no famine or calamities in times of crisis. Furthermore, in large urban models, all these economic measures including financial, agricultural, infrastructure management are all very much interlinked together. Infrastructure is one key facet which

is affected during a disaster and how much money individually stands on safeguarding these infrastructures from potential vulnerabilities is important as these are economic and financial instruments of a country.

4.2.6 Influence level of operational/management factors

Again the majority of respondents rated the influence level of operational/management factors very high when managing disasters successfully. They view these factors as basic needs when it comes to any management process, which are equally important in disaster management context as well. Respondents further described these factors including communication, decision making, level of information, quality of information, timeliness of information, cost of information, most importantly the absorptive capacity of the information that you are giving out, leadership skills, coordination and competencies as softer interpersonal skills that are very much needed in doing the things. As an example, when 2004 tsunami hit Asia, there was information that could have passed on but was not traced. Hence, just the technology itself will not help without proper management of the technology.

4.2.7 Influence level of institutional factors

A significant number of respondents agreed that the influence level of institutional factors in managing disaster successfully is very high. The reason for the choice is that institutional factors cover the implementation aspect of all the factors discussed above. Institutional factors have strong connections with legal factors, training, planning and management.

4.2.8 Influence level of political factors

According to Table 2, respondents provided different ranks for the influence level of political factors in managing disasters successfully. Respondents who ranked the influence level very high argued that in order to work institutions, planning, financial strategies and economic strategies there should be a political backing and political will. Respondent who's rank neither argued that based on different political systems and views they might take very different approaches in the way they see how things are governed, but the level at which it will affect in terms of a disaster will depend on, how that affect the institutional arrangement, the legal framework and the operational aspects. Legal, institutional and social factors to some extent have politics embedded in that. Though one respondent says the influence level is variable, it is described that the local politics is important specially when accessing the communities. In addition to that if there is a local community where people are mainly from a one particular area, politics will be heavily charged and influenced on how the decisions are made, resources are allocated, quick statutes or legislations are enforced if they are needed. As an example, as most of communities in America are affected by the BP oil spill, the president of the America has promised that they will institute new laws if it becomes a disaster. Therefore, it is argued that politics has a role to play.

4.3 How disaster knowledge factors influence disaster management cycle

This section presents the findings on the means of disaster knowledge factors influence in different phases of disaster management cycle including the mitigation/preparedness, immediate relief and reconstruction.

4.3.1 Influence of the technological factors in different phases of the disaster management cycle

Most of respondents agreed that technology plays a major role in almost all phases of the disaster. However, the technologies that use during immediate relief stage are quite different from the technologies that use during long term recovery and the preparedness stages.

Technological focus in immediate relief stage is very much on transport means to get places very quickly and to recover people effectively and efficiently through ground vehicles to helicopters. In addition sensing technology supports to gather the real time data on scale of the disaster, what has being destroyed, what is being left through satellite images etc. As these real time data supports much on subsequent decision making on resource planning and allocation it can have big impact on the disaster management cycle. During long term recovery and preparedness the technology is used very much to enhance resilient of the communities and safeguard existing communities. Effective methods of reconstruction or product modelling play a major role during long term reconstruction. In addition, product modelling will help to analyse the strength of the buildings after a disaster and to remodel better. However, the maximum impact of technology is seen during the preparedness stage as this stage allows maximum time to plan for technologies to improve the resilience of communities to face disaster. Most of the measures that a country takes to avoid disasters in preparedness stage are technology driven/ based.

However, the ability to provide usefulness or to make impact will depend on a few factors including the key parties in the disaster management cycle, who and who are using the technology, competencies that they have on the use of that technology and the environment in which it is being used. Therefore, technological factors are integrated with operational/managerial factors and social factors through institutions. While these interview findings are more similar to the literature findings, interviews were helpful to clearly identify and establish the links between technological factors and other factors.

4.3.2 Influence of the social factors in different phases of the disaster management cycle

One of the key successors of disaster management is the extent to which humans are part of the disaster management efforts or to what extent the disaster management is connected with day today lives and the operations of the society. If a society as a whole is well aware of the impending disaster

but is ready to take up and live with it, it is considered as a key success factor. For example though Japan is a country which is prone to frequent earthquakes, it is one of the world developed countries because now it is embedded into peoples' lives and people have a good level of preparedness. Therefore, as found in the literature, disaster related training, education and awareness rising are helpful to enhance the peoples' preparedness and resilient to disasters.

When it is come to immediate relief and reconstruction, the extent of peoples' network can either help or hinder the operation. If it is a society that helps each other, it can tremendously improve the ability of the social network to withstand the effect of the disaster. For example, one of the reasons for Sri Lanka to come out of tsunamis effect was that, Sri Lankans helped each other and it is embedded in the Sri Lankan's culture. Therefore, measures should be taken to maximise the networks among people.

4.3.3 Influence of the environmental factors in different phases of the disaster management cycle

As natural factors can sometimes prevent or promote disasters, the influence of natural factors on disaster management cycle is identified as follows.

When natural factors have an effect in preventing disasters, measures should be taken to ameliorate and protect such natural factors. For example, if plantation of trees would help to prevent landslides, or if plantation of shelterbelts and mangroves along the coastal areas would help to minimise the effects from waves, planting trees and mangroves could enhance the natural barriers. On the other hand if there are natural barriers already in place, measures should be taken to protect them. For instance, if mangroves and vegetations are already there in coastal areas, necessary planning measures should be taken to avoid the damages to those barriers through institutional means. When natural factors promote disasters, decision should be first made whether people should occupy these places through building and town planning. Second, if people are allowed, then the necessary man-made barriers should be introduced to minimise the possible effects. For example in Netherland, walls are built around the sea as Netherland lies below the sea level.

Therefore, the influence of environmental factors can be clearly identified during the mitigation/preparedness phase of the disaster management cycle. Interview findings suggest that natural environmental factors can promote or prevent disasters. Also it is clear from the findings that, when natural factors promote disasters, built environment has a big role to play to minimise the negative effects. In addition to that institutions are responsible in developing necessary planning and regulations to enhance and protect the existing natural barriers and to minimise the damages to the structures and people when natural factors promote disasters.

4.3.4 Influence of the legal factors in different phases of the disaster management cycle

According to the respondents, the largest impact of legal measures or legal factors will be at the prevention and mitigation stages. As disaster management policies are effective at the prevention and mitigation stages, there should be a legal backing to back up these policies. In other words, law can help to implement some of the disaster mitigation measures by incorporating them into legislations.

In addition, emergency regulations and laws related to civic duties might influence when responding to a disaster during the immediate relief. As an example, when hurricane Katrina was hit, emergency was declared in that part of America. This was partly because of human unrest. The other reason was to give central government the power to use the resources of other states. Because America has very strong state government system, one state or even the federal government or central government cannot straight away go and use resources allocated to one state. But by declaring state of an emergency it gives central government the power to do that.

4.3.5 Influence of the economic factors in different phases of the disaster management cycle

As disasters can affect the country's wealth generation mechanism, economic planning measures are accepted as very important. Therefore, the focus of economic planning measures in mitigation/preparedness stages is on protecting the country's wealth generation mechanism while is on recovering and looking for alternatives in reconstruction stage.

For example as Sri Lanka's paddy rice production is mainly based in Polonnaruwa, Anuradhapura and Kurunegala districts, a proper disaster risk assessment should be carried out in those areas to know the risks affecting the production and take actions to prevent them during the disaster mitigation stage. Similarly, risk assessments should be carried out to assess the risks of infrastructure facilities as well. When it is come to the disaster recovery/reconstruction stage, while actions should be taken to recover/reconstruct them, alternatives for such mechanisms should be looked. For instance as Sri Lanka has only one sea port and air port, man-made attacks on them are so crucial. Therefore, while it is necessary to strengthen them with radar and other means, there is a need to build a second airport and a second sea port to minimise the effects of future disasters.

When it is come to the financial factors, respondents highlighted the importance of financial management in immediate relief stage as it may have filtered out the impact on other stages. However, they emphasized the aspects of rigid policies and financial allocations throughout the disaster management cycle.

4.3.6 Influence of the operational/management factors in different phases of the disaster management cycle

It is highlighted the fact that most of operational/managerial factors are interconnected and these factors are remained important throughout the disaster management system. It is found that the management of technology is vital important and therefore there is a strong link between technological factors and managerial/operational factors. In addition, operational/managerial factors are linked with institutional factors as institutions are responsible to enhance disaster related competencies and skills.

4.3.7 Influence of the institutional factors in different phases of the disaster management cycle

Role of the institutional factors or the role of institutions is argued to be remained the same throughout the disaster management cycle. Reason for this argument is that institutions basically safeguard the implementation of all factor discussed above. Therefore, institutions are looking at those factors at different timescales, yet dealing with same issues.

4.3.8 Influence of the political factors in different phases of the disaster management cycle

As politics is an art of influencing others, factors like, legal, institutional, social and operational/management have politics embedded in them. In the sense politics has some implications not necessarily on disasters, but on the way the institutions are formed, the way operations and things are managed, the way the law is formed and so on. Therefore, the level at which political factors affect in terms of a disaster will depend on, how it affects the institutional arrangement, the legal framework and the operational/managerial aspects. Thus the implications of political factors on disaster management are appeared to be indirect through institutional, legal, social and operational/managerial aspects.

Figure 1 shows how disaster knowledge success factors are linked with different phases of the disaster management cycle. It is clear from the above findings that technological, operational/managerial, economic, social, legal and environmental factors have direct influence on the disaster management cycle while the influence of institutional factors is indirect. Influence of political factors is also indirect and it influences through institutional, operational/managerial, social and legal factors.

5 Summary

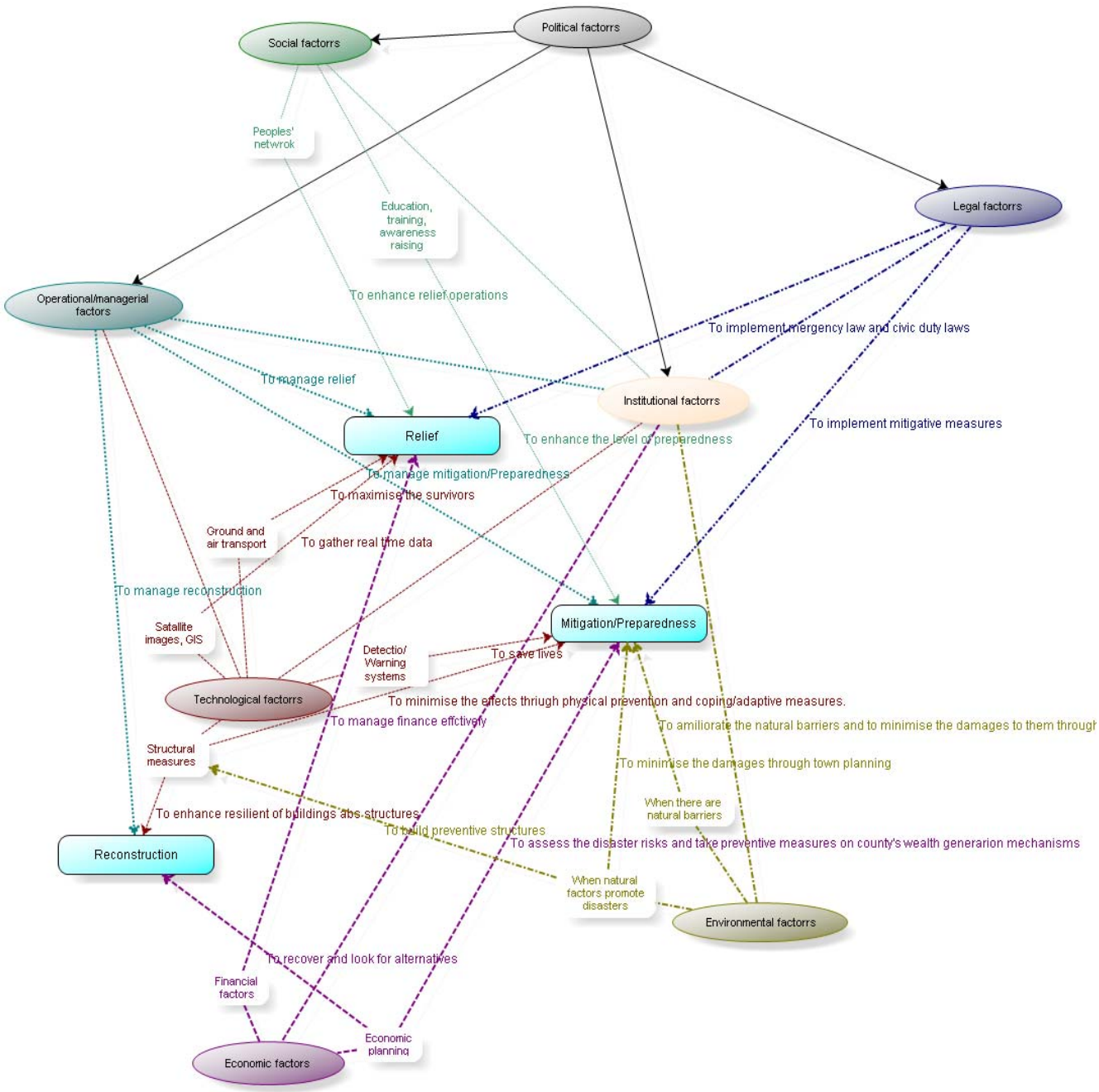
In identification of the level of influence of disaster knowledge factors in managing disasters successfully, all interviewees agreed that the influence level of social factors in managing disaster successfully is very high. Significant number of them argued that the influence level of technological and institutional factors is also very high. Influence level of economic and operational/managerial factors is rated as very high by the majority of respondents. Majority of them again rated the influence level of legal factors as high. It is difficult to conclude the respondents' rating on environmental and political factors. However, though some of the respondents rated the influence of them as neither or as

very low, in their subsequent explanations they provided some examples to highlight the importance of them.

In identification of the influence of disaster knowledge factors on different phases of the disaster management cycle, it appeared that the influence of operational/managerial factors presence throughout the disaster management cycle. Influence of institutional factors is identified within all the factors including technology, social, environmental, legal, economic and operational/managerial. Influence of political factors is noticed as indirect through institutional, operational/managerial, legal and social factors. While implications of technological and economic factors are also evident in all three phases of the disaster management cycle in different ways, influence of legal and social factors are noticeable in mitigation/preparedness phases. Environmental factors appear to influence during the mitigation/preparedness phase.

Therefore, mitigation/preparedness phase is influenced by almost all the factors identified in this research. While relief phase is influenced mostly by technological, social, legal, economic, operational/managerial, institutional and political factors; long term reconstruction phase is mainly influenced by technological, economical, operational/managerial, institutional and political factors.

Figure 1: Influence of disaster knowledge factors on different phases of the disaster management cycle



Over shapes – disaster knowledge factors

Rectangular shapes – phases of the disaster management cycle

Lines and arrows – links

6 Way forward

These findings are based on the interviews conducted with disaster management experts and these will be further supported by an extensive questionnaire survey. Aspects of good practices and lessons learned also discussed during the interviews and a research paper will be written based these findings.

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