



# **KNOWLEDGE MANAGEMENT IN DISASTER RISK REDUCTION**

*The Indian Approach*



**Government of India  
Ministry of Home Affairs  
National Disaster Management Division**

**The document is prepared by a team comprising of Sujit Mohanty, Biswajit Panda,  
Hemang Karelia and Rajeev Issar under Gol-UNDP Disaster Risk Management Programme**

## Contents

	<b>Page</b>
1. Background	1
2. Knowledge Management Concept and Principles	1
2.1 The Knowledge Management Cycle	2
3. Disaster Risk Reduction – Role of Information and Knowledge	3
4. Indian Approach to Knowledge Management in – Disaster risk Reduction Practice area	4
4.1 Creating an Environment for Knowledge Management	4
4.2 Strengths of Knowledge Networks in Disaster Management	5
4.3 The KNOWLEDGE PORTAL : A tool for Knowledge Management	6
5. Conclusion	8

## 1. Background

Indian sub-continent is susceptible to different types of natural hazards owing to the unique topographic and climatic characteristics. The occurrence of disasters along with the losses over the years has been increasing on account of larger population being vulnerable to natural hazards. India has experienced many massive disasters such as the Orissa supercyclone in 1999, Gujarat earthquake in 2001, recent devastating Tsunami-



2004 and many more in the past. This owes not only to the physical vulnerability i.e their proximity to the hazard zone and ill-maintained standards of safety to counter the effects but also due to the prevailing social and economic conditions. There is a conscious effort for Disaster Risk Reduction at National, Provincial and sub-provincial level. Thousands of organizations are supporting the effort from last few decades. However there is a felt gap in information coordination and sharing. The knowledge and experiences of disaster practitioners are remaining in individual or institutional domain. There is an urgent need of an organized common platform to capture, organize and share this knowledge and to create a versatile interface among policy-makers in the Government and disaster managers at all administrative level (National/State/District/Sub-District/Community). Acknowledging the need for a disaster knowledge networking platform to facilitate interaction and have simultaneous dialogue with all related expertise dealing with disaster management in India, the knowledge management initiative has been thoughtfully envisaged as a tool to store, retrieve, disseminate and manage information related to disaster management.

### Knowledge Management:

The creation and subsequent management of an environment which encourages Knowledge to be created, shared , learnt, enhanced, organized and utilized in and out side the organization.

## 2. Knowledge Management Concept and Principles

Knowledge Management is about applying the collective knowledge of the entire workforce to achieve specific organizational goals. It is about facilitating the process by which knowledge is created, shared and utilised.

Knowledge is defined as “the fact or condition of knowing something with a considerable degree of familiarity through expe-rience, association or contact.”

Forty years ago, Michael Polanyi provided an explanation of knowledge upon which models of knowledge creation have been built. He differentiated between **explicit, tacit and implicit** forms of

knowledge. Explicit knowledge is that which is stated in detail and leaves nothing merely implied. It is termed “codified” or “formal” knowledge because it can be recorded. Tacit knowledge is that which is understood, implied and exists without being stated. It is informal, experiential, and difficult to capture or share. It is knowl-edge that cannot be expressed. For example, an individual knows how to reach with his arm to grasp an object, but cannot describe how he knows how to do it. Implicit knowledge is that which could be expressed, but has not been. It is most often thought of as existing within the minds of individuals or in social relationships.

Nonaka and Takeuchi argue that effective organizational knowledge creation best occurs through the spiral process where knowledge is converted from tacit to explicit in a continuous and dynamic cycle, as illustrated in Figure 2. It is when tacit knowl-edge and explicit knowledge interact that innovation occurs. Knowledge creation is facilitated by deliberately managing the cycle. Organizational knowledge

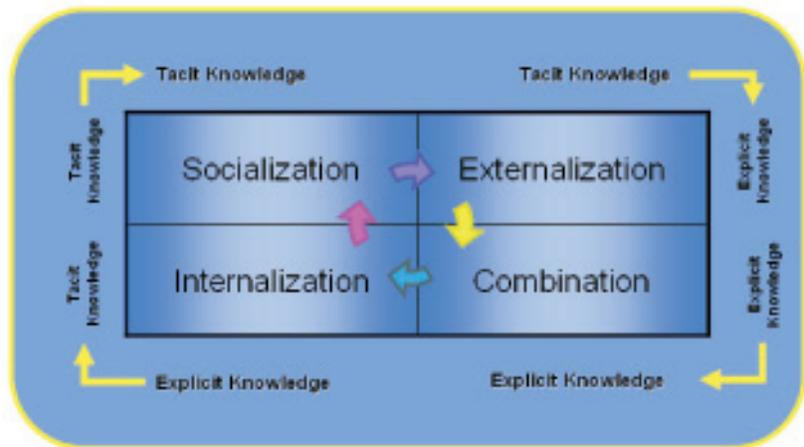


Figure 2

Source: The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation — by Ikujiro Nonaka and Takeuchi)

creation begins with socializa-tion, where individuals share experience and mental models. It develops into externalization when individuals use metaphors or analogies to articulate hidden tacit knowledge that is otherwise dif-ficult to communicate. It moves into the combination phase for knowledge to be articulated, shared and expounded. Finally, indi-viduals learn by doing and internalizing the new knowledge. The spiral begins again as the experience-based operational knowledge learned in the first cycle provides a larger knowledge base for con-tinuous innovation and growth. It is this model that demonstrates how knowledge comes into action.

## 2.1 The Knowledge Management Cycle

How knowledge processes in a KM environment are managed to convert knowledge for action and to achieve the desired results of increased value in the organization or specific operations is illustrated in the model in Figure 3. There are three general perspectives in the cycle: Management, Application and Organization:

- Management focuses on capturing, organizing and facilitating knowledge. Many of these activities span the externalization and combination quadrants of the Nonaka model.

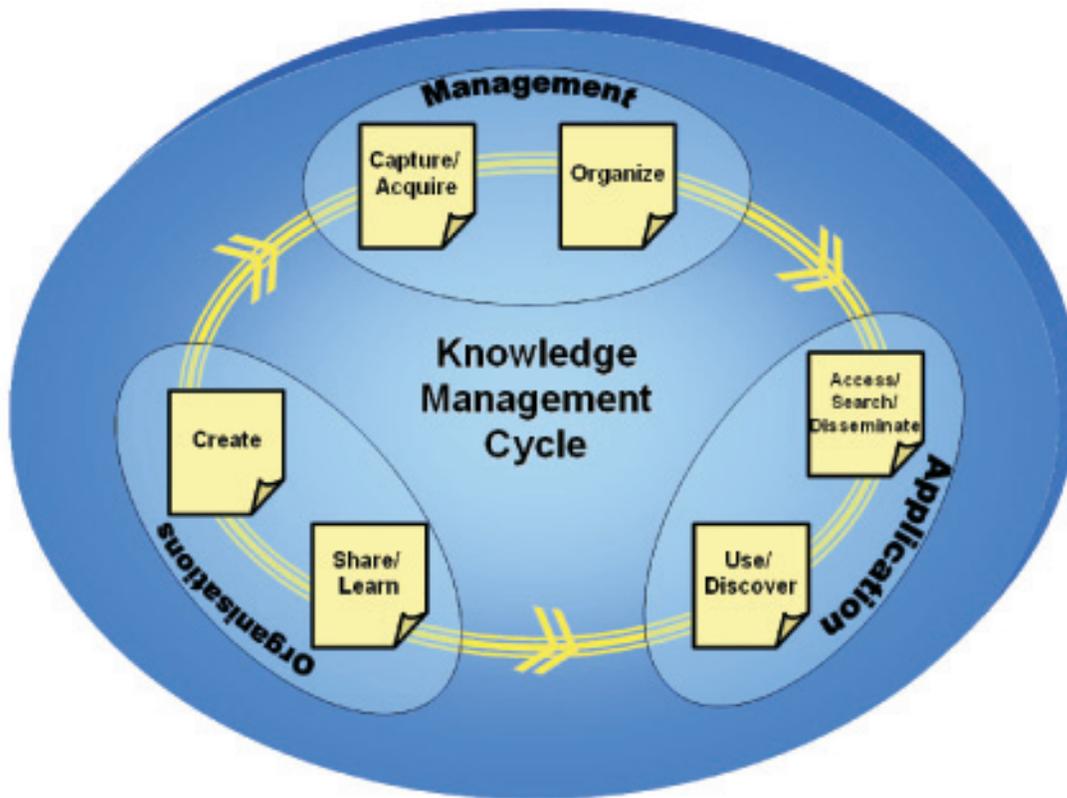


Figure 3

- Application focuses on effective retrieval of relevant content through advanced searches and mining to conduct knowledge-related work and tasks and on the use of the results for discovery. It relies on the knowledge combination portion of the model.
- Organizations focus on learning, sharing and collaboration. This is the education component of the cycle that is within the internalization quadrant, moving into the socialization portion.

### 3. Disaster Risk Reduction – Role of Information and Knowledge

Many of us assume that knowledge management is about capturing best practices and experiences people have and store it in a database with a hope that it will be useful later. In fact this is not true and many of us spend more than ten percent of our time in searching for a piece of information we know resides somewhere.

*Knowledge management is all about getting **the right knowledge, in the right place, at the right time.***

In a broader context, information about disaster preparedness, dos' and don'ts in emergency, disaster management plans, policies and guidelines are available at various domains from decades. However, millions of people are getting severely affected by disasters every year due to lack of adequate coping

mechanisms. This may be attributed to the fact that the information lying at one place is not getting transformed into the life saving knowledge for the communities at risk.

It is a proven fact that India is among the world's most disaster prone countries due to its geo climatic conditions, large population and socio-economic conditions. With the lead of Ministry of Home Affairs, Government of India, many Government & Non-Government Organizations, research and educational institutions are working towards vulnerability reduction in the country. Due to its large geography, the experiences, approaches and adopted modalities for disaster management is not codified and remains with individuals as a tacit knowledge. The linkages among all agencies working on disaster management need to be strengthened in order to derive the regional best practices and coping mechanisms.

In order to enhance the information sharing and management of the knowledge generated in these institutions, it is highly essential to closely knit the organizations/ institutions and moreover people. The network of these institutions will create a common platform and enable its stake holders and people to capture, organize, share and reuse the knowledge generated in the area of disaster management. The network will use various tools to connect the Government, Institutions and people.

## **4. Indian Approach to Knowledge Management in –Disaster risk Reduction Practice area**

Under the Ministry of Home Affairs, GOI-UNDP(United Nations Development Programme) National Disaster Risk Management programme, Knowledge Networking is foreseen as an initiative to establish networks and partnership among prime government agencies, policy makers, disaster managers and specialists from allied fields of engineering, architecture, planning, seismology, hydrology, agriculture and social science to exchange information and working together to reduce the risk of disaster. The initiative is aiming to connect all government departments, statutory agencies, research organizations/ institutions to share collectively and individually their expert know-how's. The exchange is facilitated through **physical interaction, workshops, documentation of experiences, sharing on World Wide Web Portal** etc.

### **4.1 Creating an Environment for Knowledge Management**

In order to evolve community of practices the initiative is focusing at linking the program partners (details in Fig-4) and providing a platform to collaborate. This collaborative platform which is in the form of an electronic platform will facilitate interaction among the program partners. The system will be incentive based and provide various tools, decision support systems, monitoring systems to the stake holders.

In the first phase it will connect all the program partners of Government of India comprising more than

500 institutions in the country. Subsequently conscious effort will be put in to facilitate the evolvement of various networks such as State Network comprising all State disaster management Departments, Training institution Network comprising all Administrative Training Institutions (ATIs) in India and other training institutions in disaster management area and so on.

**Connecting the program partners :**

- ❑ Disaster Management practitioners in State Government Disaster Management Departments of **35** States/UTs.
- ❑ National Programme for Capacity Building of Engineers for Earthquake Risk Management (NPCBEERM) involving **11** National Resource Institutions(NRIs) and around **125** State Resource Institutions (SRIs) in all **35** States/ UTs.
- ❑ National Programme for Capacity Building of Architects for Earthquake Risk Management (NPCBAERM) involving **7** NRIs and around **110** Colleges in all **35** States/ UTs.
- ❑ Practitioners in Urban Earthquake Vulnerability Reduction programme in **38** cities in **17** States
- ❑ Practitioners of National Earthquake Risk Mitigation Project in all seismic zone IV and V States.
- ❑ Practitioners of National Cyclone Mitigation Project.

Figure 4

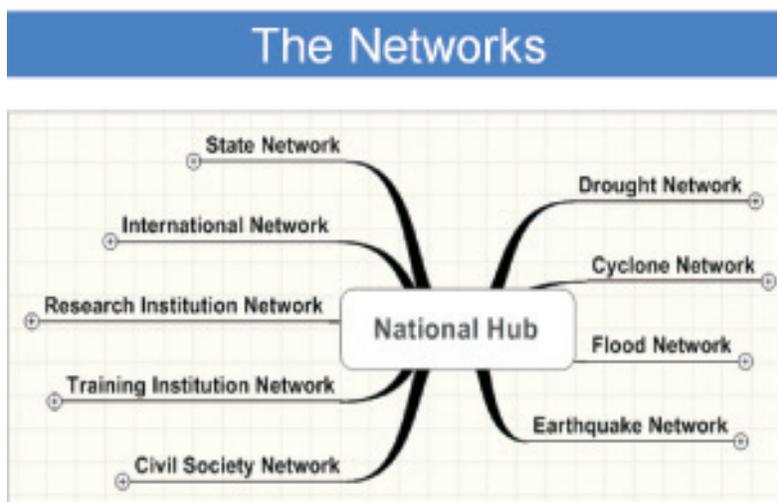


Figure 5

## 4.2 Strengths of Knowledge Networks in Disaster Management

- Better response.
- Empowered Government Disaster Management Departments.
- Better valuation of Resources and services
- Integration into mainstream development.
- Effective monitoring of initiatives.
- Promoting fair practices among the disaster management community.

### 4.3 The KNOWLEDGE PORTAL : A tool for Knowledge Management

The knowledge management initiative of Government of India involves a web portal to facilitate the knowledge collaboration between the network members. The portal provides tools to capture or acquire and organize knowledge. It also provides facility to find and share knowledge through the portal.

The portal is providing **Knowledge Collaboration Tools** and **incentive based tools** such as:

- Moderated access and facilitation.
- Programme monitoring and methodology sharing tools.
- Members workspace for decentralized content management.
- Powerful search engines.
- Moderated discussion forum for problem solving.
- Document management system.
- Moderated intra network e-mail groups.

**Other services to create an incentive for the network members:**

- GoI, Disaster Management programme monitoring tool.
- Disaster Risk Management Programme monitoring tool.

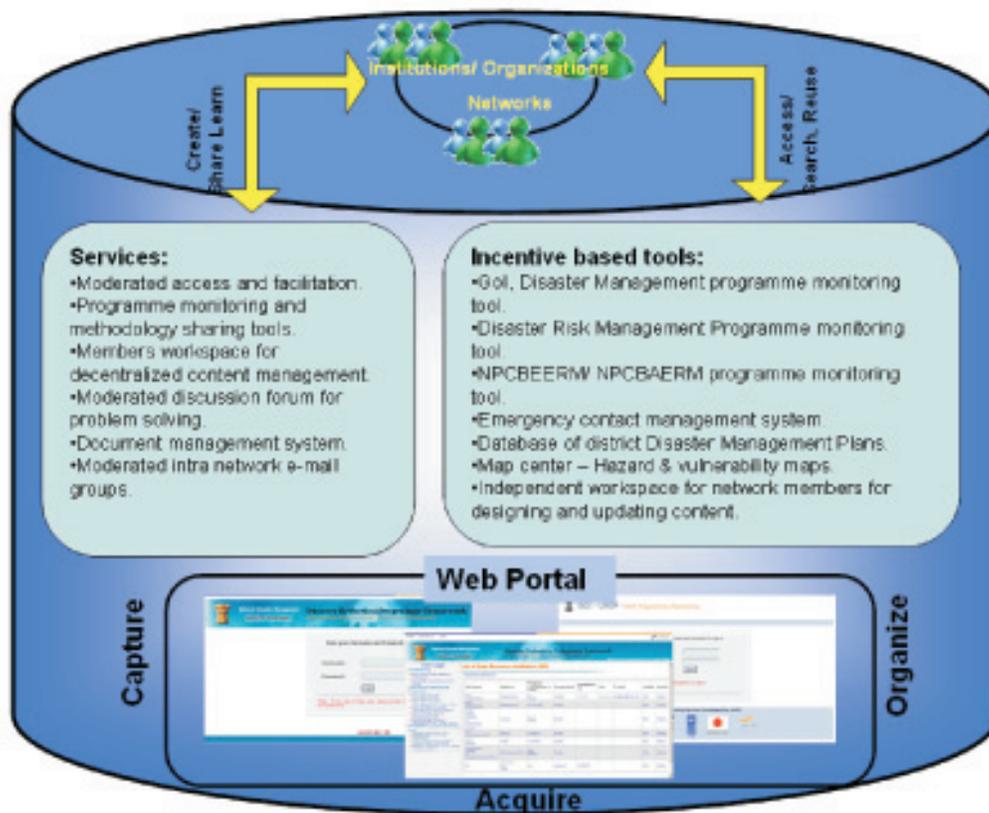


Figure 6

- NPCBEERM<sup>1</sup>/ NPCBAERM<sup>2</sup> programme monitoring tool.
- Emergency contact management system.
- Database of district Disaster Management Plans.
- Map center – Hazard & vulnerability maps.
- Independent workspace for States & Resource Institutions for designing and updating content.
- Automated portal administration for ease of content updating.

The portal is operating on an extranet and controlled by access levels. Users at the various networks are sharing their programme status and progress in the portal. The portal is capturing the products of the programme such as disaster management plans, various manuals, documents, reports, trained human resources roster etc. The portal will have a public interface once it is populated with information. The portal is also containing a List Server<sup>3</sup> which facilitates e-mail and discussion groups. The portal will enable cross postings and interactions across the networks. The description of the functioning of the portal is depicted below.

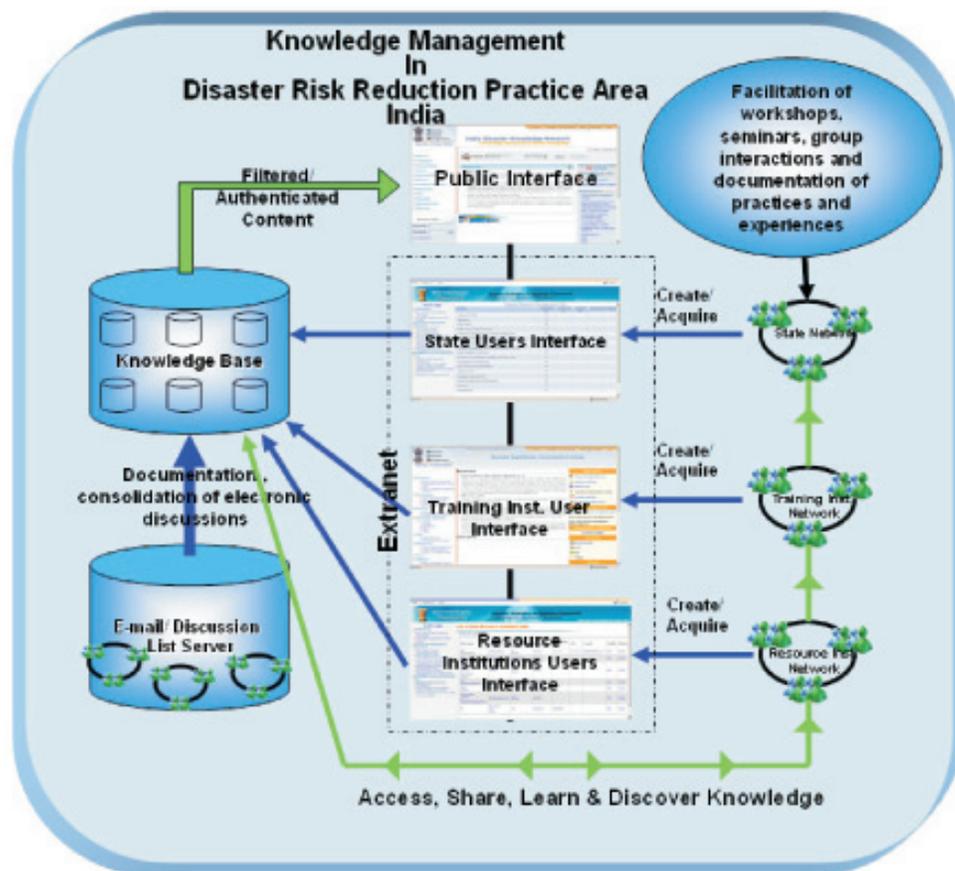


Figure 7 : KM in Disaster Management , Indian Approach

<sup>1</sup> NPCBEERM- National Programme for Capacity Building of Engineers for Earthquake Risk Mitigation - A programme of Government of India

<sup>2</sup> NPCBAERM- National Programme for Capacity Building of Engineers for Earthquake Risk Mitigation - A programme of Government of India

<sup>3</sup> List Server: Server Program that manages email mailing lists and distributes new messages, newsletters, or other postings from the list's members to the entire list of subscribers

There are various groupware and e-mail list servers to facilitate discussion and interaction of the network members.

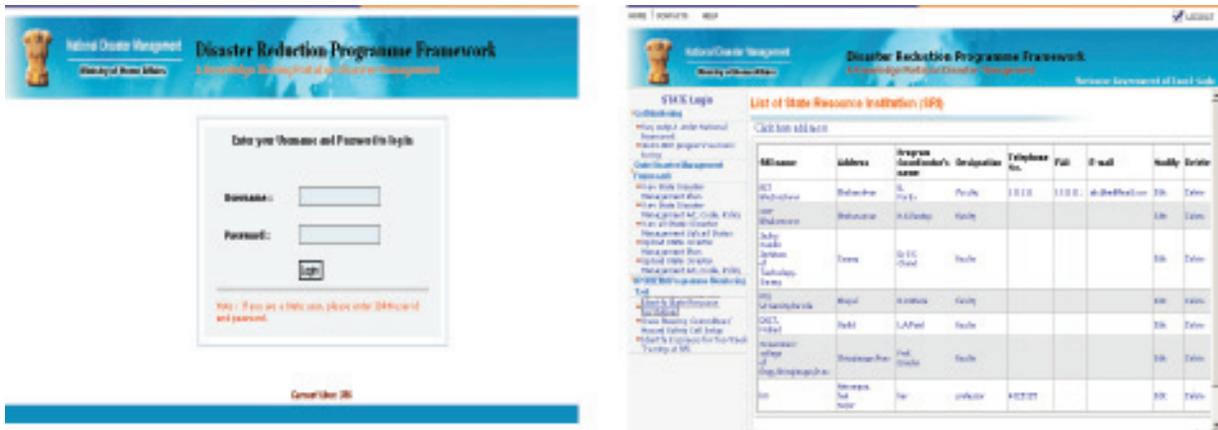


Figure 8

## 5. Conclusion

These applications illustrate how Knowledge Management principles can be brought to situational awareness, sensitization, and decision-making in disaster management practice area. In essence, knowledge organization and human knowledge conversion processes can bring a comprehensive foundation to the common operating picture, interoperability, intelligence, training and acquisitions. As a strategic approach to achieving disaster management objectives, Knowledge management will play a valuable role in leveraging existing knowledge and converting new knowledge into action through the KM cycle. Further research and development in the subject areas of information and knowledge management technology and related domains will be needed to formulate effective disaster management systems.

## References:

1. Canadian Military Journal, 2003
2. The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation — by Ikujiro Nonaka and Takeuchi)



सत्यमेव जयते

**National Disaster Management Division**

Ministry of Home Affairs, North Block

New Delhi 110 001

Phone: +91-011-23094019

+91-011-23093178

Email: [ndmindia@nic.in](mailto:ndmindia@nic.in)

Website: [www.ndmindia.nic.in](http://www.ndmindia.nic.in)