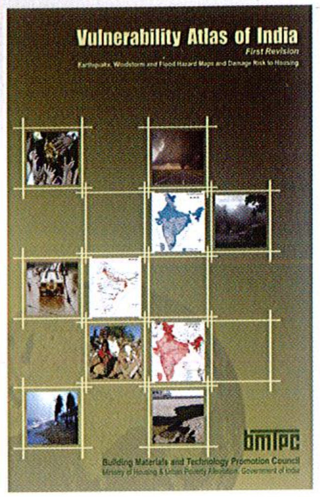
Disaster Mitigation and Management

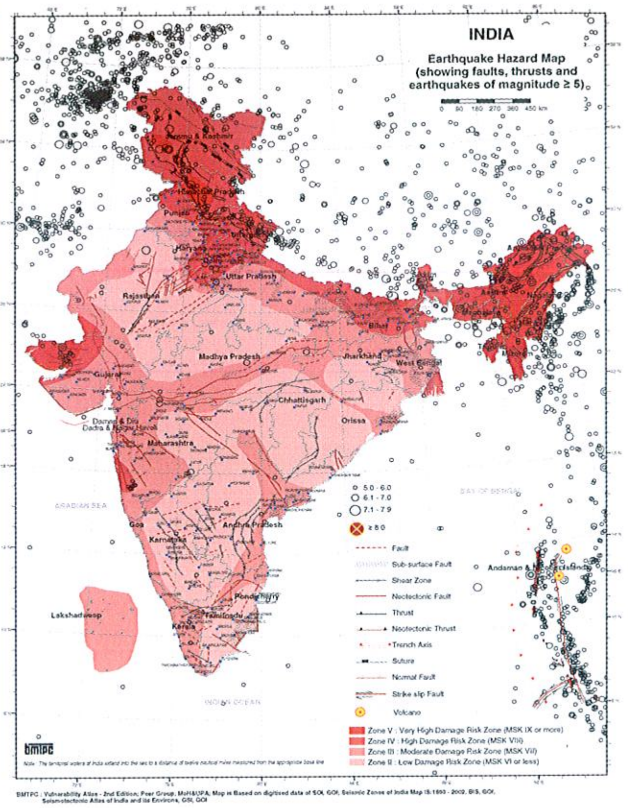
Initiatives by BMTPC

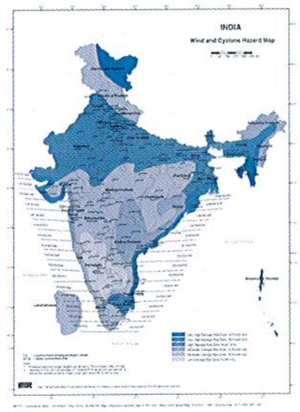
bmtpc

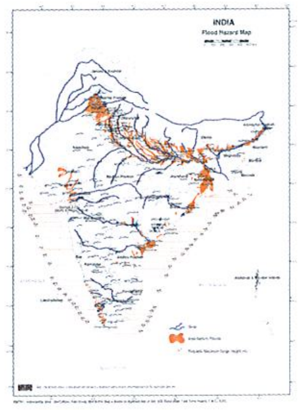
Building Materials & Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation
Government of India

Vulnerability Atlas of India









As follow up to Yokohama strategy for safer world during Mid term review of International Decade for Natural Disaster Reduction (IDNDR) 1990-2000, the then Ministry of Urban Development constituted an Expert Group (1994) to prepare the first ever Vulnerability Atlas of India. The Atlas was brought out by BMTPC in 1997 which contains hazard maps with respect to earthquakes, cyclones and floods and district wise risk tables of housing stock. Since its publication, the Atlas has proved to be an effective tool for pre-disaster mitigation and management by authorities.

Considering the formation of new states and districts, changes in earthquake hazard zonation Maps, changes in flood scenario, availability of seismo-tectonic details, updated storm surge data from IMD, changes in housing scenario, Ministry of Housing & Urban Poverty Alleviation reconstituted multidisciplinary Peer Group with experts from concerned organizations to revise and update the Atlas under the ageis of BMTPC.

The revised Atlas, prepared by BMTPC is the outcome of detailed study of all the available data in a series of meetings and dialogue by the Peer Group. The revised Atlas contains digitized hazard maps with respect to earthquakes, cyclones, floods and district wise risk tables of housing stocks as per Census 2001. This also includes Landslide hazard maps and a chapter on Tsunami.

The Atlas, with latest information on the possible intensities in the event of natural hazards and resulting risk level to housing and buildings provides a useful framework for our future disaster management planning.

The Atlas was released during the Asia Pacific Ministerial Conference on Housing and Human Settlements on 13th Dec, 2006 . And the soft copy of the Atlas - CD was released during the World Habitat Day celebrations on 6th Oct, 2008. The Atlas has also been uploaded on the NIC platform.

Based on Vulnerability Atlas of India, NDMA has entrusted BMTPC to prepare State specific Earthquak Hazard Maps and Atlases with information upto Taluka level.

Distribution of Houses by Predominant Materials of Roof and Wall and Level of Damage Risk

INDIA

Wall / Roof		Census Houses: No. of Houses	Census Houses: %	EQ Zone V	EQ Zone IV	EQ Zone III	EQ Zone II	Wind Velocity m/s 55 & 50	Wind 47	Wind 44 & 39	Wind 33	Flood Prone Area in %
				Area in %				Area in %				
INDIA				10.9	17.3	30.4	41.4	5.0	40.2	48.0	6.7	7.9
WALL												
A1 - Mud & Unburnt Brick Wall	Rural	65,807,212	26.4									
	Urban	7,991,950	3.2									
	Total	**73,799,162**	**29.6**	VH	H	M	L	VH	H	M	L	VH
A2 - Stone Wall	Rural	20,347,899	8.2									
	Urban	5,133,918	2.1									
	Total	**25,481,817**	**10.3**	VH	H	M	L	H	M	L	VL	VH
Total - Category - A		**99,280,979**	**39.9**									
B - Burnt Bricks Wall	Rural	62,715,919	25.2									
	Urban	49,175,710	19.7									
	Total	**111,891,629**	**44.9**	H	M	L	VL	H	M	L	VL	H/M
Total - Category - B		**111,891,629**	**44.9**									
C1 - Concrete Wall	Rural	2,253,979	0.9									
	Urban	4,286,359	1.7									
	Total	**6,540,338**	**2.6**	M	L	VL	VL	L	VL	VL	VL	L/VL
C2 - Wood wall	Rural	2,363,200	0.9									
	Urban	833,792	0.3									
	Total	**3,196,992**	**1.2**	M	L	VL	VL	VH	H	M	L	H
Total - Category - C		**9,737,330**	**3.9**									
X - Other Materials	Rural	24,049,304	9.7									
	Urban	4,136,627	1.7									
	Total	**28,185,931**	**11.4**	M	VL	VL	VL	VH	H	M	L	VH
Total - Category - X		**28,185,931**	**11.3**									
TOTAL BUILDINGS		**249,095,869**										
ROOF												
R1 - Light Weight Sloping Roof	Rural	69,342,567	27.8									
	Urban	17,350,091	7.0									
	Total	**86,692,658**	**34.8**	M	M	L	VL	VH	VH	H	M	VH
R2 - Heavy Weight Sloping Roof	Rural	65,299,492	26.2									
	Urban	13,036,138	5.2									
	Total	**78,335,630**	**31.4**	H	M	L	VL	H	M	L	VL	H
R3 - Flat Roof	Rural	42,895,454	17.2									
	Urban	41,172,127	16.5									
	Total	**84,067,581**	**33.7**	Damage Risk as per that for the Wall supporting it								
TOTAL BUILDINGS		**249,095,869**										

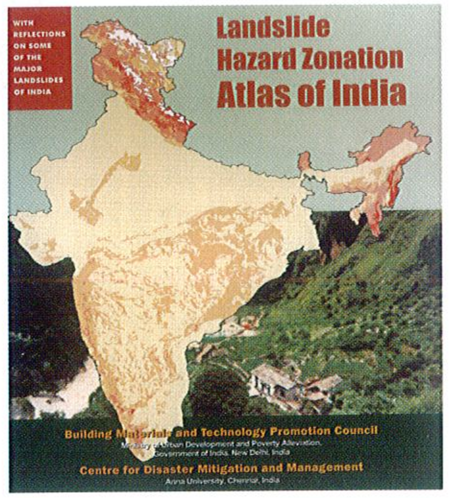
Housing Category : Wall Types
Category - A : Buildings in field-stone, rural structures, unburnt brick houses, clay houses
Category - B : Ordinary brick building, buildings of the large block & prefabricated type, half-timbered structures, building in natural hewn stone
Category - C : Reinforced building, well built wooden structures
Category - X : Other materials not covered in A,B,C. These are generally light
Notes 1 *Flood prone area includes that protected area which may have more severe damage under failure of protection works. In some other areas the local damage may be severe under heavy rains and choked drainage*
2 *Damage Risk for wall types is indicated assuming heavy flat roof in categories A, B and C (Reinforced Concrete) building*
3 *Source of Housing Data : Census of Housing, GOI, 2001*

Housing Category : Roof Type
Category - R1 : Light Weight (Grass, Thatch, Bamboo, Wood, Mud, Plastic, Polythene, GI Metal, Asbestos Sheets, Other Materials)
Category - R2 : Heavy Weight (Tiles, Slate)
Category - R3 : Flat Roof (Brick, Stone, Concrete)
EQ Zone V : Very High Damage Risk Zone (MSK ≥ IX)
EQ Zone IV : High Damage Risk Zone (MSK VIII)
EQ Zone III : Moderate Damage Risk Zone (MSK VII)
EQ Zone II : Low Damage Risk Zone (MSK ≤ VI)
Level of Risk : VH = Very High, H = High, M = Moderate, L = Low, VL = Very Low

bmtpc Building Materials & Technology Promotion Council — Peer Group, MoH&UPA, GOI

The Atlas has been recognised as a "GOOD PRACTICE" by the UN-HABITAT under Dubai International Awards for Best Practices for the year 2006.

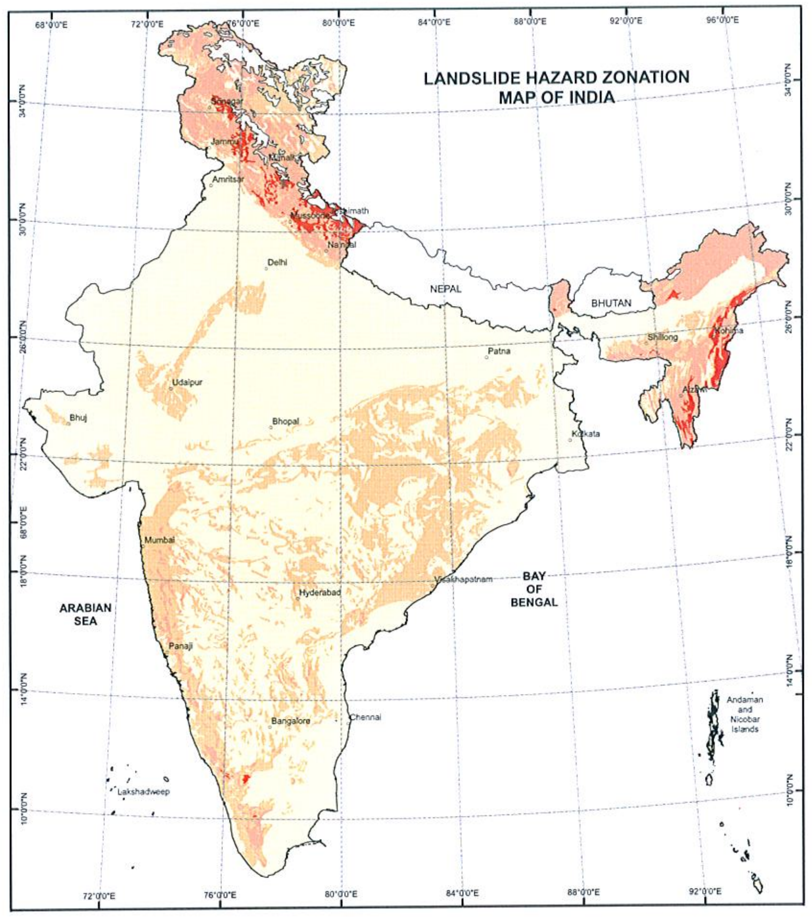
Landslide Hazard Zonation Atlas of India

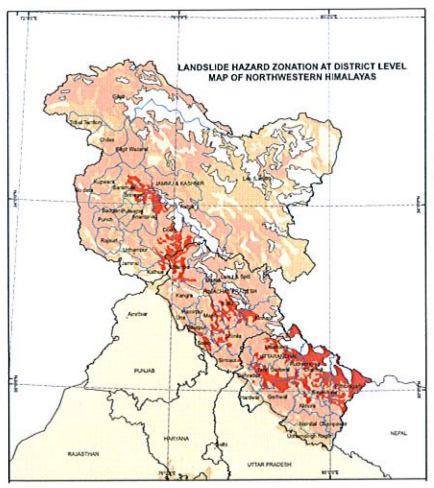


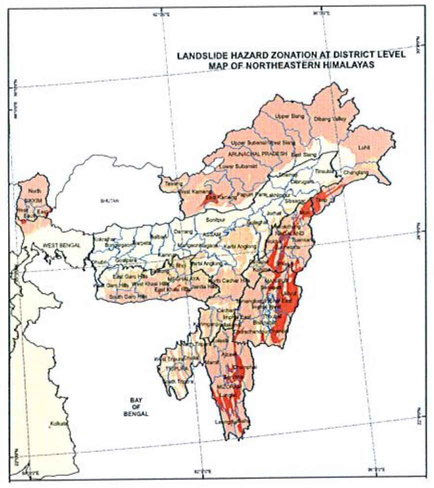
Landslides are one of the major hydro-geological hazards that affect large parts of India, especially the Himalayas, the Northeastern hill ranges, the Western Ghats, the Nilgiris, the Eastern Ghats and the Vindhyas.

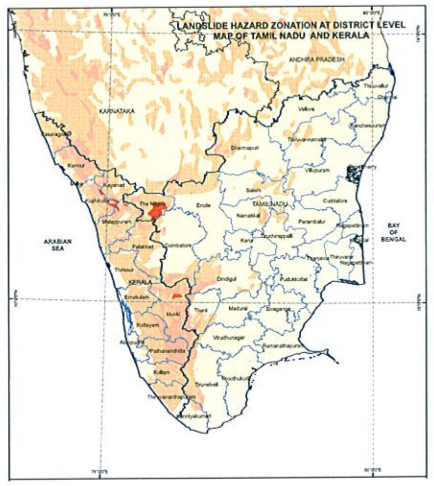
To extend the scope of the Vulnerability Atlas of India published by BMTPC to include consideration of hazards due to landslides, alongside earthquakes, floods and cyclones, the Council jointly with the Centre for Disaster Mitigation and Management, Anna University, Chennai prepared the first Landslide Hazard Zonation Atlas of India as a tool for macro level assessment of landslide hazards and for prioritizing hazard mapping projects towards reduction of vulnerability.

The Atlas presents the first ever GIS based Landslide Inventory Map and Landslide Hazard Zonation Map of India, both produced at the scale of 1:6 million. The hazard map is the product of a state-of-the-art approach of integrating factor maps, centered around the landslide inventory map of India, called the Mother Map. The whole mapping approach is based on the simple logic that for the inferred hazards to be reliably depicted, they must stand the scrutiny of observed landslide hazards. The best fit between the observed and the inferred hazards was obtained by iterative integration of factor maps, taking recourse to fine tuning of weights and ranks.

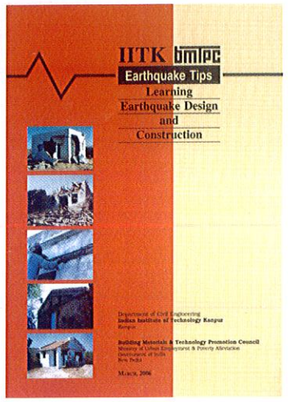






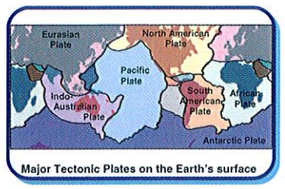


Earthquake Tips : Mass awareness programme through vernacular languages

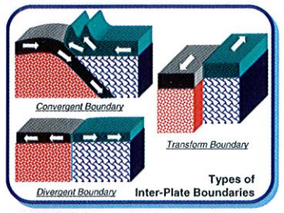


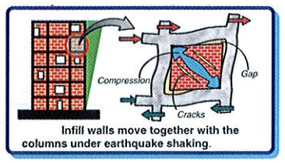
A project was launched by BMTPC in collaboration with IIT Kanpur for preparation and dissemination of 24 "Earthquake Tips". These tips are targeted for awareness creation and guidance to professionals and common man. The Following Tips have been published both on print and internet:

- EQ Tip 1 : What Causes Earthquakes?
- EQ Tip 2 : How the ground shakes?
- EQ Tip 3 : What are Magnitude and Intensity?
- EQ Tip 4 : Where are the Seismic Zones in India?
- EQ Tip 5 : What are the Seismic Effects on Structures?
- EQ Tip 6 :How Architectural Features Affect Buildings During Earthquakes?
- EQ Tip 7 : How Buildings Twist During Earthquakes?
- EQ Tip 8 : What is the Seismic Design Philosophy for Buildings?
- EQ Tip 9: How to Make Buildings Ductile for Good Seismic Performance
- EQ Tip 10: How Flexibility of Buildings Affects their Earthquake Response?
- EQ Tip 11: What are the Indian Seismic Codes?
- EQ Tip 12: How do Brick Masonry behave during Earthquake?
- EQ Tip 13: Why should Masonry Buildings have simple Structural Configuration?
- EQ Tip 14: Why are horizontal bands necessary in masonry buildings?
- EQ Tip 15: Why is vertical reinforcement required in masonry buildings?
- EQ Tip 16: How to make Stone Masonry Buildings Earthquake Resistant?
- EQ Tip 17: How do Earthquake Affect Reinforced Concrete Buildings?
- EQ Tip 18: How do Beams in RC Buildings Resist Earthquakes?
- EQ Tip 19: How do Columns in RC Buildings Resist Earthquakes?
- EQ Tip 20: How do Beam-Column Joints in RC Buildings Resist Earthquakes?
- EQ Tip 21: Why are Open Ground Storey Buildings Vulnerable in Earthquakes?
- EQ Tip 22: Why are Short Columns more damaged during Earthquakes?
- EQ Tip 23: Why are Buildings with Shear Walls Preferred in Seismic Regions?
- EQ Tip 24: How to reduce Earthquake Affects on Buildings?

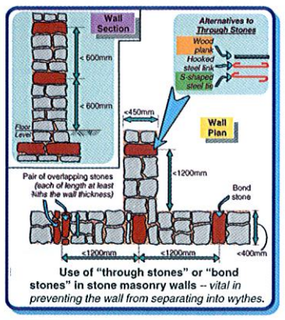


Major Tectonic Plates on the Earth's surface

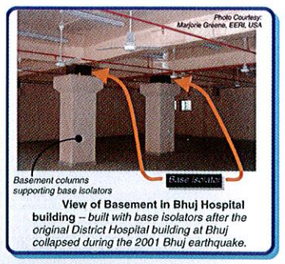




Infill walls move together with the columns under earthquake shaking.



Use of "through stones" or "bond stones" in stone masonry walls – *vital in preventing the wall from separating into wythes.*



View of Basement in Bhuj Hospital building – *built with base isolators after the original District Hospital building at Bhuj collapsed during the 2001 Bhuj earthquake.*

The tips released on a monthly basis were also published and printed in various building and construction related journals and magazines which have a combined reach of several thousands of users. These tips are written in an easy-to-understand simple language and are supported by figures and diagrams to create awareness and provide knowledge about earthquakes and safety measures. The Council has received appreciation both from professionals and common people about the usefulness of the tips. The Council is also contemplating to publish the following 8 more Earthquake Tips:

- EQ Tip 25: Why are Load Paths Important in Earthquake-Resistant Structures?
- EQ Tip 26: What are the Problems in Load Paths of Buildings?
- EQ Tip 27: How can Non-structural Elements be made Safe during Earthquakes?
- EQ Tip 28: Why is Confined Masonry better for Housing in Earthquake areas?
- EQ Tip 29: What are the Essential Features of Confined Masonry?
- EQ Tip 30: What are the Concerns in Earthquake-Resistant Foundations?
- EQ Tip 31: Why Buildings Tilt and Sink into the Ground during Earthquakes?
- EQ Tip 32: Why is Quality Control Important in Earthquake-Resistant Buildings?

Capacity Building Programme in Gujarat

After January 2001 earthquake. BMTPC partnered with Gujarat State Disaster Management Authority (GSDMA) and undertook a Capacity Building Programme for:

- Awareness creation and strengthening disaster preparedness at community level
- Dissemination of disaster resistant construction technologies using innovative and cost effective building materials.

Under this Capacity Building programme , 5500 masons were trained in use of disaster resistant construction technologies and 50 engineers were also trained. Under the programme construction of one model house alongwith water tanks in each 477 villages and retrofitting of 442 Public Buildings, spread over 5 districts of Kachchh, Rajkot, Jamnagar, Surendranagar and Patan was undertaken.

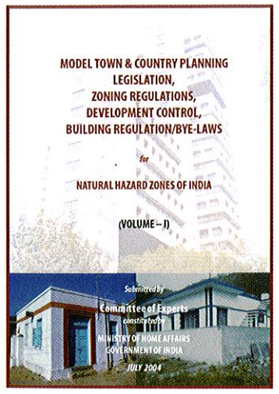
Capacity building programme was envisaged to make the earthquake rehabilitation programme a people's programme wherein the people undertake the reconstruction, repair and retrofitting based on the awareness created through the programme with the help of the government engineer and local building artisans. This ambitious programme also attempted to take to people's doorstep the disaster resisting building technologies that are based on the local materials, local technologies and local available resources for constructing new houses that are suitable to people's lifestyle and local conditions and retrofitting of existing houses.

The model houses constructed under the project are serving as a disaster prepardness centres.

Strengthening Techno-Legal Regime for Safety against Natural Hazards

Recent past earthquakes (Uttarkashi, 1991, Latur, 1993, Jabalpur, 1997, Chamoli 1999, Bhuj 2001 & Kashmir 2005) have clearly demonstrated the vulnerability of our building stocks, which has caused wide spread damages resulting into loss of lives and property. This is mainly due to faulty construction practices which do not follow earthquake resistant features complying with Codal practices.

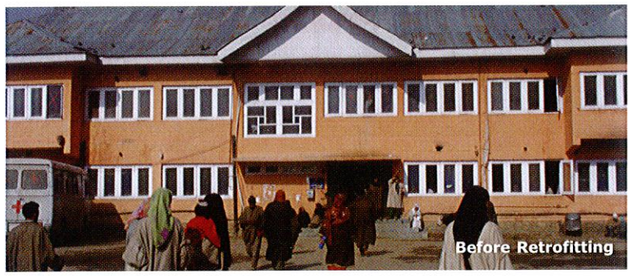
To address this gigantic problem, the Ministry of Home Affairs constituted a Committee of Experts to develop Model Building Bye-Laws and City, Town & Country Planning Act and the Zoning Regulations. After detailed deliberations, the final recommendations were brought on the following:



- Proposed Amendment in existing Town and Country planning Legislations
- Regulations for Land Use Zoning
- Additional Provisions in Development Control Regulations for Safety against natural hazards, and
- Additional Provisions in Building Regulations/Byelaws for Structural Safety - in Natural Hazard Zones of India

In order to assist State Governments in modifying their building byelaws for safety against natural hazards, the Council is also organising technical workshops in various States. So far more than twenty workshops have been organised in different States.

Retrofitting of Sub-Divisional Hospital in Kupwara, J&K

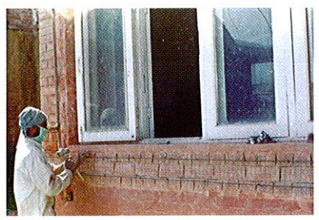


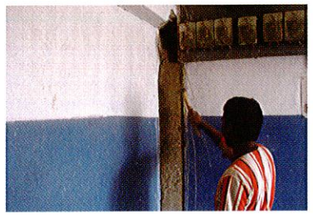
After the earthquake of magnitude 7.6 (Richter Scale) on 8th October, 2005 with epicenter located at Muzzafarabad in Pakistan, just near the LOC, only 140 km from Srinagar in Kashmir, BMTPC retrofitted the Sub-Divisional Hospital Building in Kupwara as this building had number of deficiencies in so far safety against earthquakes are concerned. In the recent quake, cracks developed in several parts of the front as well as rear wings, notably in the (a) brick piers in between the windows, as well as in the (b) tall walls flanking the staircase. Almost all these cracks are classified as Grade 2 damage and the strength of these walls had substantially decreased on account of damage.

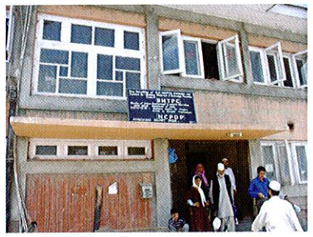
The Retrofitting of the building was carried out to ensure desirable seismic performance level included the following:

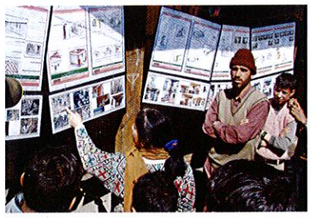
- Installation of vertical reinforcement in all corners.
- Encasement of all openings with seismic belts made of welded wire mesh and rebars attached to walls.
- Installation of eave level seismic belt on one face of all walls and on both faces of walls having length greater than 5m.
- Anchoring of roof deck to walls using MS angle brackets or other suitable options
- Improving the diaphragm action of the roof deck of the front wing by installation of diagonal bracing on the top of the bottom chord of roof.

Sensitization of local public through distribution of literature on retrofitting in Urdu was part of retrofitting programme.









Retrofitting of School Buildings

Seismic retrofitting of existing vulnerable buildings is one of the most challenging tasks before the architechts & structural engineering fraternity. A large number of existing buildings in earthquake prone areas over the world need seismic retrofitting due to various reasons & motivations, including codal modifications, deterioration of structures with age or change in use or modification of structure. Earthquake damaged buildings may also need retrofitting along with repair of damaged portion for reuse. Seismic retrofitting of existing stock is one of the most effective methods towards seismic risk reduction in future & to have safe & better habitat.

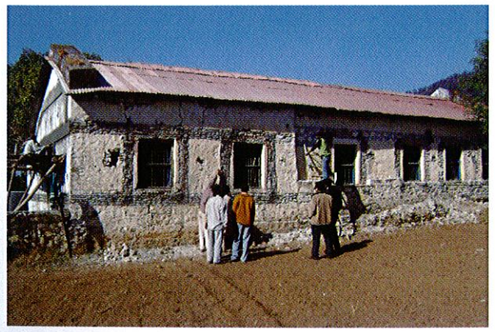
In its efforts to demonstrate the retrofitting techniques for seismic strengthening, the Council has initiated to showcase the technologies through retrofitting of public buildings. Keeping this in mind, BMTPC carried out the retrofitting of few MCD school buildings, preferably one each in Municipal wards of Delhi, so that the awareness could be generated among the people as well as various government agencies about the need and techniques of retrofitting.

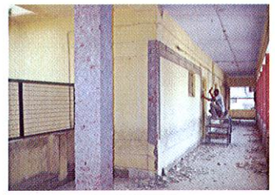
To start with, retrofitting of MCD School buildings have been undertaken for their seismic strengthening at • Vasant Vihar (South Zone), • Rana Pratap Bagh (Civil Lines Zone), • Ramesh Nagar (girls) (West Zone), • Ahata Thakur Dass - Girls (Karol Bagh Zone), • Ram Nagar (Sadar Paharganj Zone) • Lajpat Nagar, and • Vivek Vihar.

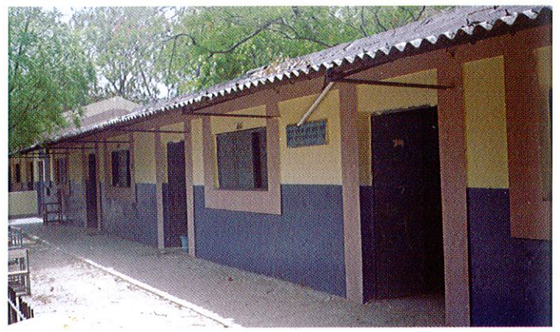
In the course of retrofitting, an awareness programme for around 250 MCD engineers was conducted on the subject with a view to train them in seismic strengthening techniques.

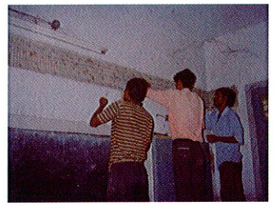
Apart from above, a 100 year old stone masonry school building was retrofitted in Dehradun and masons were sensitised during the course of retrofitting.

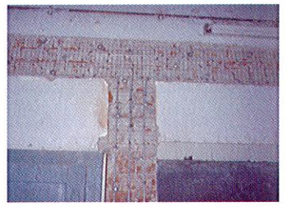
The experience on these buildings would help people at large and the policy makers in working towards reducing the vulnerability of lakhs of existing buildings through retrofitting of public and private buildings, thus protecting most number of people in case of future earthquakes.

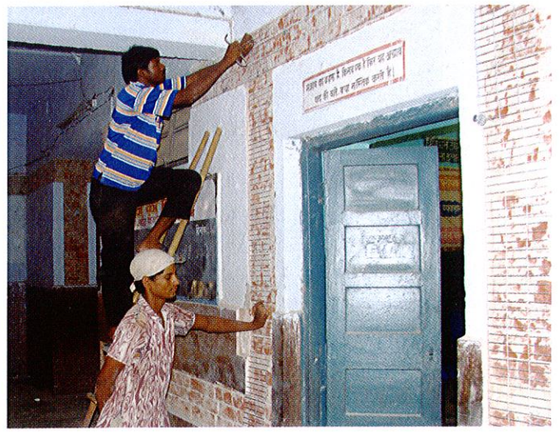












TOT Programme on Earthquake Resistant Design & Construction

The Bihar Institute of Public Administration and Rural Development (BIPARD), Government of Bihar at the behest of the Bihar State Disaster Management Authority requested BMTPC's assistance in conducting Training of Trainers (TOTs) Programme on Earthquake Resistant Design and Construction.

In order to impart training, standardised Resource material for Training of Engineers and Architects in the form of a book entitled "Design & Construction of Earthquake Resistant Structures : A Practical Treatise for Engineers & Architects" has been prepared in association with Deptt. of Earthquake Engineering, IIT Roorkee and Padmashree Dr.A.S.Arya, Professor Emeritus, IIT Roorkee and Member, BSDMA. Under this project, BMTPC is organising training programmes for Training of Trainers – 16 batches for Engineers and 10 batches for Architects.

BMTPC in association with BIPARD, Government of Bihar kick-started the series of Training of Trainers (TOTs) Programme by organisation of Sensitization Programme on "Earthquake Resistant Design and Construction" jointly with IIT Roorkee on 15th January, 2013 at Patna.

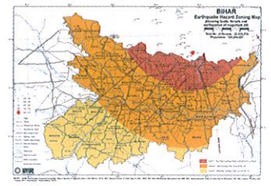
So far seven batches of Training of Trainers (TOT) programme have been organized successfully. The resource persons are from IIT Roorkee, IIT Mumbai, NIT Patna, BMTPC including other experts in the field. At the end of training of each batch, evaluation of trainees has also been conducted through examination.

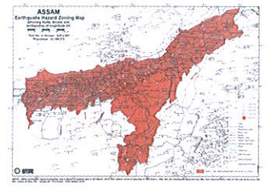
Earthquake Hazard Zoning Atlas for NDMA

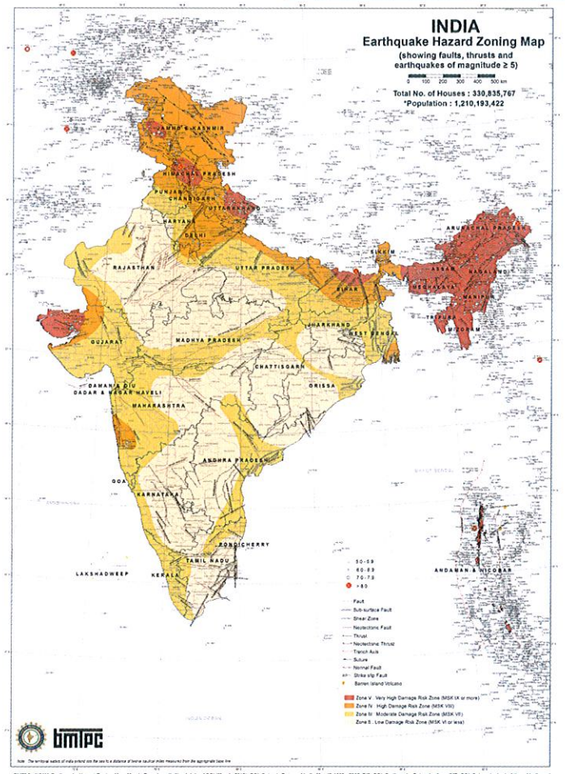
In its pursuit towards main streaming disaster risk reduction in housing sector, BMTPC has made significant contributions towards disaster mitigation and management, since its inception in 1990.

Looking at the overall importance of seismic hazard in Indian context and associated risks involved, the National Disaster Management Authority, Government of India entrusted BMTPC the task of preparing updated earthquake hazard maps up to district level incorporating latest data as available from Survey of India, Census and Geological Survey of India, India Metrological Department etc. An Memorandum of Understanding (MOU) was signed with NDMA in this regard on 22nd November, 2011.

The Council is at present preparing the earthquake hazard maps for India, 35 States/UTs covering all Districts. Besides country Atlas, BMTPC is also preparing State-wise Atlases as regards earthquake hazards. The work is currently under progress and Maps have been generated for 24 States as per Survey of India updated data. It is further envisaged to incorporate latest digitised administrative boundary data from Census of India.







INDIA

Wall / Roof		2001 Census Houses		2011 Census Houses	
		No. of Houses	%	No. of Houses	%
INDIA					
WALL					
A - Mud / Unburnt Bricks	Rural	6,58,07,212	26.4	6,60,82,280	26.5
Unburnt Brick Wall with mortar	Urban	79,91,950	3.2	1,08,08,689	4.3
Total - Category - A		***7,37,99,162***	***30***	***7,68,90,969***	***31***
B - Burnt Bricks + Stone packed	Rural	8,30,63,818	33.3	10,45,82,560.0	42.0
with mortar	Urban	5,43,09,628	21.8	7,50,35,035.0	30.1
Total - Category - B		***13,73,73,446***	***55***	***17,95,87,595***	***72***
C1 - Wood + Concrete	Rural	46,17,170	1.9	58,31,438.0	2.3
	Urban	51,20,151	2.1	79,33,512.0	3.2
Total - Category - C		***97,37,330***	***4***	***1,37,64,950***	***6***
X - Other Materials	Rural	2,40,49,304	9.7	3,00,97,412.0	12.1
	Urban	41,36,627	1.7	45,41,522.0	1.8
Total - Category - X		***2,81,85,931***	***11***	***3,46,38,934***	***14***
TOTAL BUILDINGS		**24,90,95,869**		**30,48,82,448**	
ROOF					
R1 - Light Weight	Rural	6,93,42,567	27.8	7,94,30,355	26.1
Sloping Roof	Urban	1,73,50,091	7.0	2,12,69,826	7.0
	Total	***8,66,92,658***	***34.8***	***10,07,00,181***	***33.1***
R2 - Heavy Weight	Rural	6,52,99,492	26.2	7,40,34,404	24.3
Sloping Roof	Urban	1,30,36,138	5.2	1,96,49,099	6.4
	Total	***7,83,35,630***	***31.4***	***9,36,83,503***	***30.7***
R3 - Flat Roof	Rural	4,28,95,454	17.2	5,30,98,931	17.4
	Urban	4,11,72,127	16.5	5,73,99,833	18.8
	Total	***8,40,67,581***	***33.7***	***11,04,98,764***	***36***
TOTAL BUILDINGS		**24,90,95,869**		**30,48,82,448**	

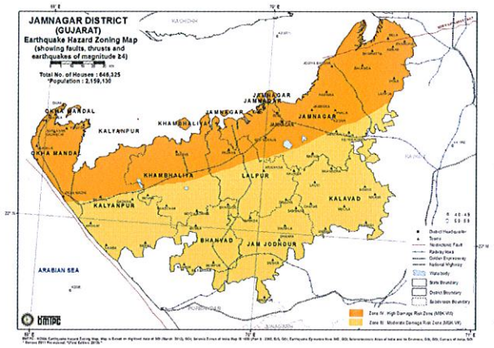
Housing Category by Wall Types
Category-A: Buildings in field –stone, rural structures, unburnt brick houses, clay houses
Category-B: Ordinary brick building, buildings of the large block & prefabricated type half timbered structures, building in natural hewn stone
Category-C: Reinforced building, well built wooden structures
Category-X: Other materials not covered in A,B,C. These are generally light (new WI)
Damage Risk for Wall types is indicated assuming heavy flat roof in categories A,B and C. Reinforced Concrete Buildings

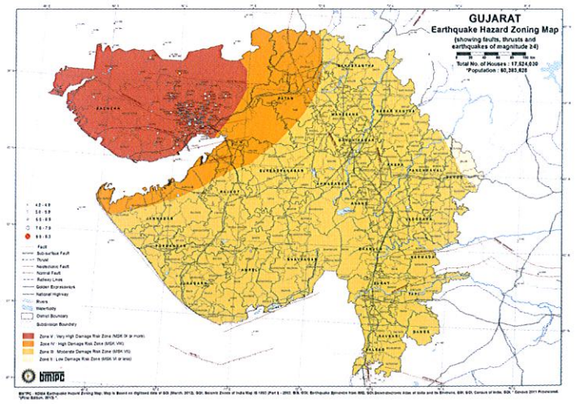
Housing Category by Roof Type
Category- R1: Light Weight (Grass, Thatch, Bamboo, Wood, Mud, Plastic, Polythene, G1 Metal, Asbestos Sheets, Other Materials)
Category- R2: Heavy Weight (Tiles, Slate)
Category- R3: Flat Roof (Brick, Stone, Concrete)

Earthquake Hazard Proneness
EQ Zone V: Very High Hazard Zone (MSK>IX)
EQ Zone IV: High Hazard Zone (MSK VIII)
EQ Zone III: Moderate Hazard Zone (MSK VII)
EQ Zone II: Light Hazard Zone (MSK VI)

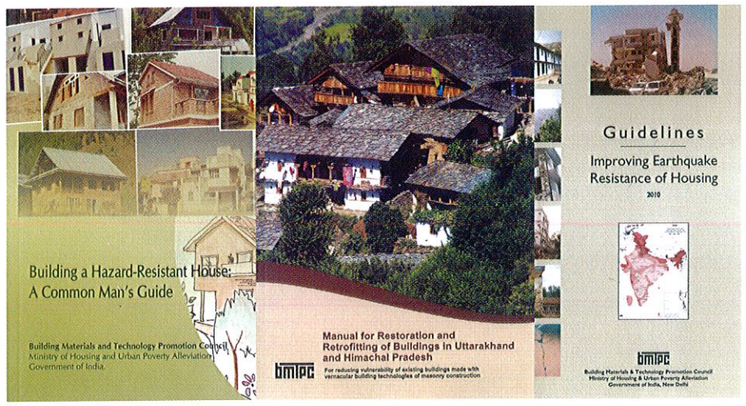
Level of Damage Risk
Level of Risk: VH = Very High, H= High, M= Moderate, L= Low, VL= Very Low

Source of Housing Data: Census of Housing, GoI, 2011.



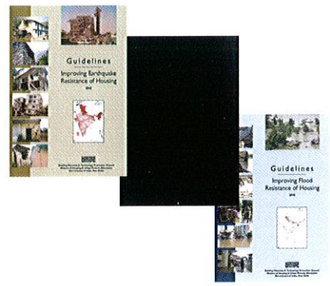


Guidelines/ Manuals in the area of Disaster Mitigation

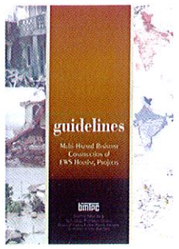


The Council has brought out a number of publications in the area of disaster mitigation and management. These have been widely disseminated for creating awareness and spreading technical information amongst professionals, decision makers and public at large. Some of the them are:

Guidelines on Earthquake, Flood and Cyclone resistance of Housing



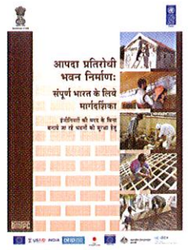
BMTPC has published three guidelines namely Guidelines for Earthquake Resistance of Housing, Guidelines on Improving Wind/Cyclone Resistance of Housing and Guidelines on Improving Flood Resistance of Housing. The Guidelines would serve as an explanatory handbook on the various clauses of Indian Standards which are important from the point of view of designing new buildings or improving resistance of existing building stock.



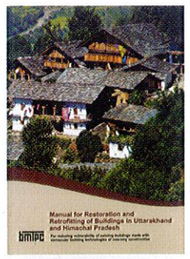
Guidelines for Multi-Hazard Resistant Construction of EWS Housing Projects

The Guidelines for Multi-Hazard Resistant Construction of EWS Housing Projects published by BMTPC, empowers the professionals through series of checklists, tables and forms, to look for hazard resistant features given in Indian Standards and use them while designing and preparing the project reports.

Guidelines on "Aapda Pratirodhi Bhawan Nirman : Sampurn Bharat ke liye Margdarshika"



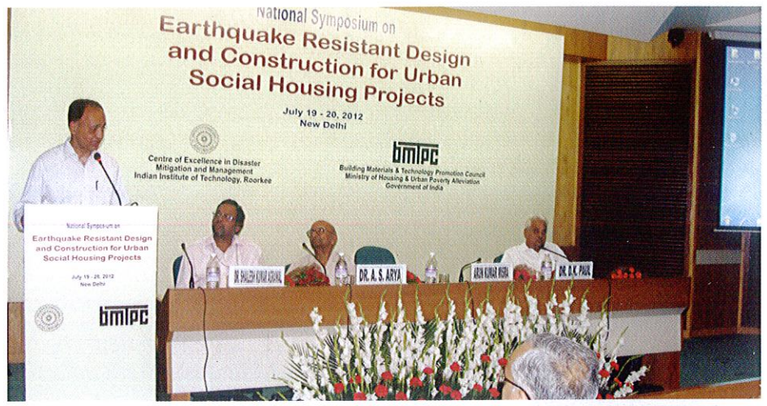
At the behest of UNDP, BMTPC brought out Hindi translation of UNDP - Ministry of Home Affairs, English Manual on Disaster Resistant Construction : Safety of housing being constructed without the help of engineers. The guidelines will also help in creating awareness amongst common people as regards disaster resistant techniques.



Manual for Restoration and Retrofitting of Buildings in Uttarakhand and Himachal Pradesh

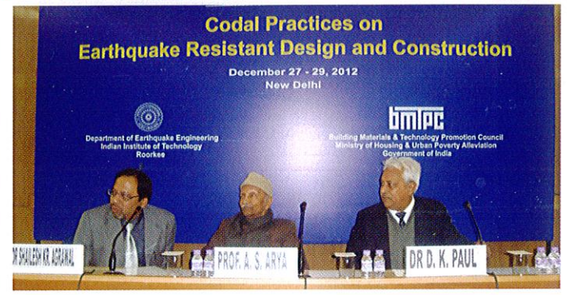
This manual is prepared for the restoration and vulnerability reduction through retrofitting of the existing buildings in Uttarakhand and Himachal Pradesh situated in the Western Himalayan belt of India. It covers the traditional building systems other than the reinforced concrete frame, being used by the people of the region.

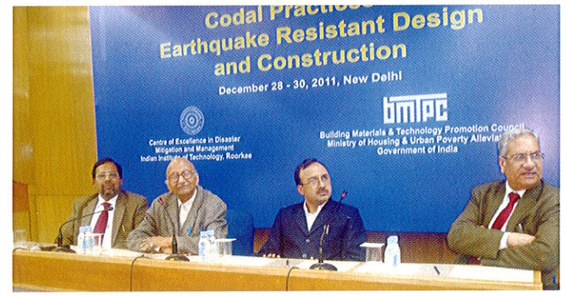
Capacity Building & Skill Upgradation

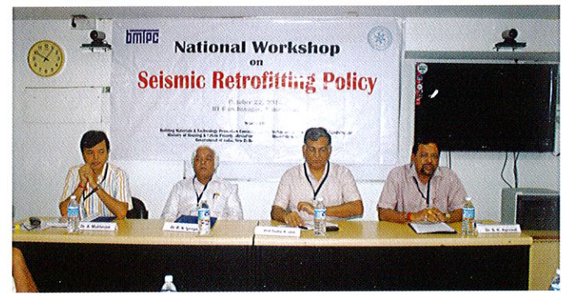


The Council is continuously striving to establish the proactive approach towards disaster mitigation and management and has been in the forefront in educating and creating mass awareness amongst stakeholders and the common man. In its endeavour to promote earthquake resistant design and construction and build the capacities of the practising professionals, a number of National Symposiums, Seminars, Workshops and Short Term Training Programmes were organised on Earthquake Resistant Design and Construction on regular basis. These Capacity Building Programmes have been organised jointly with Centre of Excellence in Disaster Mitigation & Management, IIT, Roorkee and other academic institutions. The participants in the programmes mainly comprising of engineers and architects at higher and middle level both from public and private organizations. The sub-topics covered during the Capacity Building Programmes are as follows:

1. Elements of Structural Dynamics and Seismic Response Estimation of Structures
2. Lessons Learnt during Past Earthquakes
3. Philosophy and Principles of Earthquake Resistant Design and Construction
4. Earthquake Resistant Design of Masonry Buildings and codal provisions
5. Design of R.C. buildings including Ductility Provisions including code of practices
6. Earthquake Resistant Design of Steel Frame Buildings
7. Seismic Analysis and Design of Multi-storeyed Buildings
8. Seismic Base Isolation and Supplemental Energy Dissipation Techniques
9. Seismic evaluation of buildings including vulnerability assessment
10. Seismic retrofitting of existing buildings
11. Case Studies







The Building Materials & Technology Promotion Council (BMTPC) was setup in 1990 under the Ministry of Housing & Urban Poverty Alleviation to bridge the gap between laboratory research and field level application.

Vision

BMTPC to be world class knowledge and demonstration hub for providing solutions to all with special focus on common man in the area of sustainable building materials, appropriate construction technologies & systems including disaster resistant construction.

Mission

To work towards a comprehensive and integrated approach for promotion and transfer of potential, cost-effective, environment-friendly, disaster resistant building materials and technologies including locally available materials from lab to land for sustainable development of housing.

PUBLICATIONS AND VIDEO FILMS RELATED TO DISASTER PREPARDNESS & MITIGATION

1. Manual on Basics of Ductile Detailing
2. Vulnerability Atlas of India (First Revision - 2006) - Earthquake, Windstorm and Flood Hazard Maps and Damage Risk to Housing with CD
3. Landslide Hazard Zonation Atlas of India - Landslide Hazard Maps and Case Studies
4. Building A Hazard-Resistant House : A Common Man's Guide
5. Manual for Restoration and Retrofitting of Buildings in Uttrakhand and Himachal Pradesh
6. Guidelines for Improving Earthquake Resistance of Housing
7. Guidelines for Improving Flood Resistance of Housing
8. Guidelines for Improving Wind/Cyclone Resistance of Housing
9. Manual for Repair and Reconstruction of Houses Damaged in Oct.1991 Earthquake in Garhwal Region, UP.
10. Guidelines for Damage Assessment and Post- Earthquake Action for Chamoli and Jabalpur
11. Retrofitting of Kupwara Sub-Divisional Hospital
12. Building a New Techno-Legal Regime for Safer India
13. Simple Ways to Earthquake Safety for J&K
14. Earthquake Tips : a mass awareness programme through vernacular langauages.
15. Seismic Retrofitting of MCD School Buildings in New Delhi
16. Design & Construction of Earthquake Resistant Structures : A Practical Treatise for Engineers & Architects

Video Films

1. Makan ho to Aisa
2. Abhivardhan
3. Lessons from Latur
4. Seismic Retrofitting
5. Build A Safer Tomorrow
6. Rekindling Hope

Other Initiatives

- Evoloving methodoogy for retrofitting of OPD building of Bara Hindu Rao Hospital, New Delhi
- BMTPC undertook rapid assessment of nature and extent of damage to buildings after the earthquakes of Uttarkashi (1991), Latur (1993), Jabalpur (1997), Chamoli (1999), Kutchchh (2001), cyclones of Tamil Nadu, Kerala, Andhra Pradesh in 1994 and cyclone in East & West Godavari districts (1996), Gujarat (1998) and floods in Punjab, Haryana (1996). Based on the assessment, prepared Technology Options for repair, reconstruction and retrofitting of houses for disaster affected areas.
- Provided technical support to Asian Disaster Preparedness Centre under ADB Funded Project on Strengthening Disaster Mitigation and Management in Uttaranchal.
- Provided technical support to National Task Force constituted by MHA for Special Study of Lakshadweep Islands to assess vulnerability to various hazards and suggest mitigation/ prevention measures.
- Prepared Guidelines for Improving Earthquake, Wind/Cyclone, Flood and Landslide resistance of housing and also prepared Manuals, Do's and Don'ts, Posters, Pamphlets, etc. in local languages.
- A number of Video Films and publications have been brought out on disaster resistant technologies.
- Organising Training Programmes on Disaster Resistant Technologies jointly with IITs & other institutions. Also involved in providing Training to 300 engineers in J&K after the recent earthquake.
- Building capacities of ULBs in the area of disaster mitigation and management through JNNURM projects.
- Established strong linkages with the National Disaster Management Authority (NDMA) and National Institute of Disaster Management (NIDM), Ministry of Home Affairs, etc.

For further details contact:

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