



# National Conference on Crowd Management

## Proceedings

Jointly organized by

**National Disaster Management Authority**

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## 1. Introduction

India's population is equivalent to 17.86% of the total world population. The population density in India is 452/km<sup>2</sup>. India is well known all over the world as a country of cultural, religious and traditional festivals characterized by numerous events of mass gathering across the nation, such as Kumbh Mela at Allahabad.

The crowd disasters, in general, are man-made disasters. Recurring stampedes at places of Mass gatherings, which include religious places, railway stations and venues of sports/social/political events, are of serious concern to the nation. The contemporary security environment coupled with rapid urbanization, improved transportation facilities and relatively easy access to important shrines like Badrinath and Kedarnath Dham, enhances our vulnerability to crowd related disasters stand significantly enhanced. The need to improve preparedness and build more capacity to manage such disasters has therefore been manifold.

### 1.1 The Rationale

The National Disaster Management Authority (NDMA) has issued guidelines for integrated approach to crowd management in 2014 titled "Managing crowd at events and venues of mass gathering - a guide for state governments, local authorities, administrators and organizers". The document available on NDMA website ([ndma.gov.in](http://ndma.gov.in)) was circulated to all the states in order to enable them to prepare appropriate guidelines and plans for effective and efficient crowd management. The guide classified the reasons for crowd disaster as (a) Structural failure, (b) Human errors, (c) Natural causes. The guide also observes that a mere glance through the list of causes of crowd disasters suggests that such disasters can be completely prevented with proactive and holistic planning and flawless execution. A thorough assessment of arrangements made at places of mass gathering with the above list of potential causes, in mind should dramatically reduce the chances of a disaster. Another interesting observation is that, majority of the crowd disasters in India and in other developing countries have occurred at religious places, venues of music concerts, night clubs and shopping malls. With population explosion and rapid urbanization, Indian cities are also becoming susceptible to crowd disasters at such venues.

Festivals or events, attracting mass gathering experience unexpected temporary surge in the number of people at the event locations. Agencies responsible for organizing and managing such places would need to formulate strategic plans for public safety and make special arrangements for managing crowds. It is important for the authorities responsible for granting license/registration/permission for events/venues of mass gathering to comply with the guidelines. Besides, there is a need for enhancing awareness on "causes and triggers" for crowd disasters among all the stakeholders.

Since the conference is being co-hosted by the KSDMA, the conference has covered certain state specific issues too:

- Most of the temples, churches and mosques in Kerala organize annual prayers as festivals. These festivals attract huge crowds even at the village level and thus have a potential for occurrence of stampedes. Sabarimala pilgrimage, Attukal Ponkala and Thrissur Pooram are

a few among the major religious gatherings in Kerala. Apart from the religious worship, many of the festivals organize entertainment programmes, free food distribution and pyrotechnic works. Thus the venues of religious festivals become locations for worship, entertainment business attracting people from various religious backgrounds. The temple festivals in Kerala also engage elephants for colourful procession and other rituals.

- Two major stampedes occurred in the State in the past, one, the human stampede at hilltop near Pampa at Sabarimala in 1999 which killed 52 pilgrims and another on Makarajyothi day at Sabarimala in 2011 which killed 102 pilgrims. The stampede at the Makarajyothi View Point took the lives of pilgrims from Tamil Nadu, Karnataka and Andhra Pradesh. The most recent crowd disaster which shook the entire state was Fire Cracker Accident at Puttingal temple, Kollam District which claimed 109 lives.
- Kerala has constituted a State level Crisis Management Group (CMG) to address anthropogenic hazards including festivities related accidents (stampedes). The State has also prepared Standard Operating Procedures for Festival Disasters in 2015.

A snapshot of a few major crowd management related disasters in India		
Event date	Location & Event	Casualty
23-12-1995	Dabwali, Haryana, Fire at a school function held in a shamiyana (Tent)	446
24-02-1997	Baripada, Odisha, Fire at a religious congregation	206
25-01-2005	Wai, Satara, Shri Kalubai Yatra Mandhardev, Maharashtra	293
14-01-2008	Chamunda Devi Temple, Jodhpur, Rajasthan	249
14-01-2011	Sabarimala Stampede, Pathanamthitta, Kerala	102
10-04-2016	Puttingal Fire Cracker Explosion, Kollam, Kerala	109

The list above includes incidents where the casualties have gone beyond 100. Apart from the above list, and there are many other crowd disaster incidents across India where people have lost lives, sustained severe injuries and suffered huge damage & losses. This calls for serious interventions, deliberations and planning at the National, State and District levels. Hence this two days conference has been planned.

## 1.2 Objectives

The conference has been structured to attain the following objectives

- To learn from the past crowd disasters and understand the causes and triggers
- To share, among different stakeholders, the knowledge of the best practices of crowd management. To understand crowd disaster preparedness & mitigation efforts to enhance safety in mass gatherings
- To discuss cross cutting issues such as legal framework, use of ICT and role of media
- To discuss essentials of planning and coordination for events of mass gatherings
- To discuss issues related to safety in festivals using animals and safety in fireworks at mass congregations
- To discuss challenges & gaps in the existing practices of crowd management

## 1.3 Target audience

The attendees of the conference included:

- Representatives of the State Governments/Union Territories
- Representatives of SDMA's
- Representatives of Shrine Boards/ Religious trusts/Event organizers etc.
- Representatives of response agencies – NDRF, SDRF, Armed Forces and Fire Services etc.

#### 1.4 Schedule of the conference

DAY 1 – 11 <sup>th</sup> JULY 2017		
Registration	9.00 – 10:00 AM	
Inaugural Session – 11 <sup>th</sup> JULY 2017 10.00 AM -11.00 AM		
Welcome	Mr. P.H Kurian IAS, Additional Chief Secretary, Disaster Management, State Relief Commissioner and Convener, KSDMA	
Presidential Address	Mrs. Nalini Netto IAS, Chief Secretary & Chief Executive Officer, KSDMA	
Keynote Address	Mr. R.K Jain IAS (Rtd), Member, National Disaster Management Authority	
Inaugural Address	Mr. E Chandrasekharan, Hon'ble Minister for Revenue & Disaster Management & Vice Chairman, Kerala State Disaster Management Authority	
Vote of Thanks	Maj. Gen. Dr. V.K Naik, KC, AVSM (Rtd), NDMA	
TEA BREAK: 11:00 AM - 11:30 AM		
Technical Session I: Understanding Risk (Causes and Triggers)-11.30AM to 01:00 PM		
Chair	Mr. Kamal Kishore, Member, NDMA	
Co-chair	Mr. A Hemachandran IPS, DGP and DG, Fire & Rescue Services & Civil Defense, Kerala	
Rapporteur	Ms. Felicia Nesapriya P, Intern, KSEOC (M.Sc Student, Department of Geography, University of Madras)	
NDMA Guidelines on Crowd management	11:30 AM-11:50AM	Dr. Pavan Kumar Singh, Senior Research Officer, NDMA
Development of crowd management plans with special reference to AardhKumbh at Nasik 2015	11:50 AM-12:10 PM	Col. V. Supnekar, Director, Centre for Disaster Management, YASHADA, Pune
SOP for festival related disasters	12:10 PM-12:30 PM	Dr. Sekhar L. Kuriakose, Member Secretary, KSDMA
Discussion/Q&As	12:30 PM-01:00 PM	Chair/Co-Chair
LUNCH: 01:00 PM - 01:50 PM		
Technical Session II: Lessons Learned/Experience sharing and Best Practises – 01:50 PM to 5:50 PM		
Chair	Lt. Gen (Rtd) N.C Marwah, PVSM, AVSM, Member NDMA	
Co-Chair	Prof. Dr. Janki Andharia, Dean, Jamsetji Tata School of Disaster Studies, TISS	
Rapporteur	Ms. Mahima Antony, Intern, SEOC (M.Sc Student,	
Crowd Management – Tirupati Devasthanam	01.50 PM - 2.10 PM	Mr. M.G Gopal IAS (Rtd) Former Special Chief Secretary, Telangana
Crowd management in Kerala (case of Sabarimala)	02.10 PM - 2.30 PM	Mr. A Hemachandran IPS DGP & Director General, Fire & Rescue Services, Govt. of Kerala
Best practices-Crowd management – AARDHKumbh, Haridwar,	02:30 PM -03:50 PM	Mr. J.S Martolia IPS, IG, Uttarakhand Police

2016		
Discussion/Q&As	03:50 PM-04:10 PM	Chair/Co-Chair
TEA BREAK:04:10 PM-04:20 PM		
Rapporteur	Mr Praveen A.V, Intern, KSEOC (M.Sc Student, Central University, Pondicherry, Andaman Campus)	
Matha Naina Devi Ji temple –Human Stampede	04:20 PM-04:40 PM	Mr. Dev Dutt Sharma IAS, Special Secretary (Revenue - Disaster Management)
Crowd Management – Nabakalebara RathYathra, 2015, Orrisa	04:40 PM-05:00 PM	Mr. Binyanand Jha IPS Additional DGP, Law & Order, Govt. of Odisha
Crowd Management – Shri. Mata Vaishno Devi Shrine Board	05:00 PM-05:20 PM	Dr. M.K Kumar, Addl. CEO, Shri. Mata Vaishno Devi Shrine Board
Discussion/Q&As	05:20 PM-05:30 PM	Chair/Co-Chair
Day II: 12 <sup>th</sup> JULY 2017		
Technical Session III: Planning &Coordination - 09:30 AM to 11:10 AM		
Chair	Mr. Lokanath Behra IPS, DGP and State Police Chief	
Co-chair	Dr. Muraleedharan, Attukal Temple Trust	
Rapporteur	Ms. Pooja Tat, Intern, KSEOC (M.Sc Student, Central University, Pondicherry, Andaman Campus)	
Development of Crowd Management Plans – Railways Perspective	09:30 AM - 09:50	Prof. Sanjay Tripathi Indian Railway Institute of Transport Management
Role of Police & NDRF in Crowd Management	09:50 AM - 10:10	Mr. Sandeep RaiRathore IPS Inspector General of Police, Coastal Security Group, Tamil Nadu
Role of Civil Defense, NGOs,CSOs, in Mass gatherings/events	10:10AM - 10:30	Mr. G.S Saini, VSM Director, NCDC Nagpur
Medical Preparedness and plans for mass gatherings/Events	10.30 AM - 10.50	Dr. Anil V Assistant Director (Public Health), Directorate of Health Services, Govt. of Kerala
Discussion /Q&As	10:50AM -11:10 AM	Chair/Co-Chair
TEA BREAK:11:10 AM -11:30AM		
Technical Session IV: Safety standards - Fire Works and Use of Animals in Festivals - 11:30 AM to 12:50 PM		
Chair	Mr. BinyanandJha IPS, Additional DGP, Law & Order, Govt. of Odisha	
Co-chair	Mr. Sanjay Tripathy IRTS, Sr. Professor, IRITM, Lucknow	
Rapporteur	Ms. Felicia Nesapriya P, Intern, KSEOC (M.Sc Student, Department of Geography, University of Madras)	
Safety in fireworks Operations/pyrotechnic works	11.30 AM - 11.50	Mr. Kantha Swamy Deputy Director, Explosive, PESO (Petroleum &Explosives Safety Organization)
Crowd Management in festivals using Animals(ThrissurPooram)	11.50 - 12.10	Dr. A Kowsigan IAS District Collector, Thrissur, Kerala
Coordinating Sabarimala Pilgrimage	12.10 - 12.30	Mrs. R. Girija IAS District Collector, Pathanamthitta, Kerala
Discussion/Q&As	12:30 PM - 12:50	Chair/Co chair

LUNCH BREAK:12:50 PM-01:50 PM		
Technical Session V: Cross Cutting Issues – 01:50PM to 03:20 PM		
Chair	Mr. Satyajeet Rajan IAS Principal Secretary, Personnel & Administrative Reforms Department, Govt. of Kerala	
Co-chair	Dr. K. Ambady IIS, Director, Public Relations Department, Kerala	
Rapporteur	Ms Mahima Antony, Intern, KSEOC (M.Sc Student, Department of Geography, University of Madras)	
Use of Technology in Crowd Management	01:50 PM-02:10 PM	Mr. Vinod Kumar Boggarapu Country Leader, Connected Operations & Smarter Cities, IBM Watson IOT
Role of Media	02:10 PM-02:30 PM	Mr. Venkitesh Ramakrishnan Senior Associate Editor, Frontline, The Hindu
Discussion/Q&As	02:30 PM - 02:50	Chair/Co-Chair
TEA BREAK:02:50 PM-03:20 PM		
Valedictory Session – 12 <sup>th</sup> July 2017 03:20 PM - 04:30 PM		
Summary of the Deliberations	03:20 PM-03:50 PM	Dr.V. Thiruppugazh IAS, Joint Secretary (Policy & Plan),NDMA
Remarks	03:55 PM-04:10 PM	Mr. R K Jain IAS (Rtd) Member, National Disaster Management Authority Mr. Subrata Biswas IAS Additional Chief Secretary, Home and Vigilance and Member, KSDMA Mr. P.H Kurian IAS Additional Chief Secretary, Disaster Management
Valedictory Address	04:10 PM - 04:25 PM	Adv. V.S Sunil Kumar Hon'ble Minister for Agriculture & Member KSDMA
Vote of Thanks	04:25 PM - 04:30 PM	Dr.Sekhar L. Kuriakose Member Secretary, KSDMA, Govt. of Kerala

## 1.5 Venue

The workshop was organized at Hotel Samudra (Kerala Tourism Development Corporation) in the picturesque vicinity of Kovalam Beach. KSDMA also organised an exhibition of various equipment and publications used for disaster management in the state.



## 2. Daily proceedings

### 2.1 Day 1 | 11<sup>th</sup> July 2017 – Highlights

#### Inauguration

Hon'ble Minister in his inaugural speech highlighted the following points.

- People gathering together in a public place and crowding of people who are connected by a common interest are essential happenings in a democracy
- Crowd management strategy shall be sensitive to the legitimate purposes and sentiments of people
- Take the collective spirit of the crowd into confidence and prepare them to behave responsibly
- Need to talk to all stakeholders to review some of the long standing practices related to religious and cultural festivals
- Technology shall be given due priority to reduce errors, misjudgements and consequent damages

Mrs. Nalini Netto IAS, Chief Secretary, Kerala delivered the presidential address and highlighted that crowd management is in essence effective physical and psychological management with the help of technology. Mr. R.K Jain IAS (Rtd), Member, NDMA delivered the Keynote address. He highlighted the need for the conference and the objectives of the conference to the participants and the expectations of NDMA. Mr. P.H Kurian IAS, Additional Chief Secretary, Disaster Management, Kerala delivered the welcome speech and Major General V.K Naik (Rtd), Consultant, NDMA proposed vote of thanks. Three members of NDMA namely Mr. R.K Jain IAS (Rtd), Mr. Kamal Kishore and Lt. Gen. N.C Marwah (Rtd) were present during the inauguration session.

#### Technical Session I | Understanding risk (causes and triggers)

1. NDMA Guidelines on Crowd management - Dr. Pawan Kumar Singh, Senior Research Officer, NDMA

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Being the apex authority of disaster management in the country the NDMA has formulated the guidelines for crowd management, and the vision of it is explained here</li> <li>• The importance of crowd management to be dealt with relevant legal provisions which are emphasized in the guideline for management of the crowd. A list of</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building at several levels is needed widely</li> <li>• Prevention strategies through planning, legal provisions, mitigation measures through disaster management plans at different levels should be put in place.</li> </ul>

<p>laws and acts already exist for crowd management in India.</p> <ul style="list-style-type: none"> <li>• The guideline stands for integrated approach with application of science and technology to achieve desired goals</li> </ul>	
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2. Development of crowd management plans with special reference to Aardh Kumbh at Nasik 2015 - Col. V. Supneker, Director of Center for Disaster Management, YASHADA, Pune.

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• The Response mechanism deals with the components of event management in an efficient way which was the case of Aardh Kumbh at Nasik.</li> <li>• This experiment put forward a model of Incident Response System of the organization</li> </ul>	<ul style="list-style-type: none"> <li>• Strategies and mechanism should be inclusive of planning which is based on the analysis of the hazard with respect to the location and culture.</li> <li>• Documentation, familiarization, rehearsals, volunteering are the important components for effective crowd management.</li> </ul>

3. SOP for festival related disasters - Dr. Sekhar L. Kuriakose, Member Secretary of KSDMA

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• There are several kinds of crowd management scenario in Kerala varied by political, religious, cultural purposes/aspects</li> <li>• One of the major risk is due to the unsafe usage of explosives/crackers at such mass gathering</li> <li>• Effective implementation of SOP and crisis communication can play a vital role in managing crowds.</li> <li>• Travencore-Cochin Public Health Act 1955 provides basic guidelines on SOP in Kerala</li> </ul>	<ul style="list-style-type: none"> <li>• The best way out of this challenge is legalizing the SOP's through DDMP</li> <li>• The festival management committee SOP is also a progressive strategy of crowd management, but still it has been challenged by the lack of specific SOP's based on the type of festivals/events</li> <li>• Snake Boat race festivaes will need a separate SOP</li> </ul>

**Technical Session II –Lessons learned and best practices**

## 4. Crowd Management – Tirupati Devasthanam - Mr.M.G Gopal IAS (Rtd)

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• The effective crowd management system established at Tirupathi Devasthanam can be a model for similar pilgrim destinations.</li> <li>• The geographical risk &amp; vulnerability were studied to mitigate the disaster risk</li> <li>• A novel concept of providing amenities for carrying out rituals implemented at the place</li> <li>• The queueing system introduced for effective crowd management has reduced stampede, it was learned that there was a huge decline in the issues related to high population density of the place</li> <li>• A voluntary service stated by TTD named as Srivari seva, a noble concept of ‘Manav seva Madhav seva’, which could also increase the management effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• It is an essential step to understand the carrying capacity of the site and shall support to regenerate the biodiversity</li> </ul>

## 5. Crowd management in Kerala (Case of Sabarimala) - Mr. A Hemachandran IPS, DGP &amp; Director General, Fire &amp; Recuse Services, Govt. of Kerala

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Sabarimala, Pathanamthitta district, a land where the devotees are treated as Ayyappa i.e.; the incarnation of Lord himself. It is 3000 feet above the sea level</li> <li>• Issues were based on predicting the number of pilgrims, habitat of wild animals, existence of divergent route to reach the temple, inadequate</li> </ul>	<ul style="list-style-type: none"> <li>• Regulate the carrying capacity of Pamba and Sanidhanam, need of a comprehensive mapping, effective plan of evacuation and avoiding discriminatory practices</li> </ul>

<p>infrastructural facilities, limitation of carrying capacity etc.</p> <ul style="list-style-type: none"> <li>• The best practice put forward was the barricading system, effective communication by CCTV monitoring (round the clock monitor), virtual queue system which is an online portal for devotees to book their slot</li> <li>• Special commissioner deputed by the high court for monitoring</li> </ul>	
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6. Best practices – Crowd management: AARDH Kumbh, Haridwar, 2016 - Mr. J.S Martolia IPS , IG, Uttarkhand Police

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• The ArdhKumbh Mela, which is a symbol of well-being, starts from 1<sup>st</sup> January to 14<sup>th</sup> April.</li> <li>• The challenge was the geographical binding because of the rivers forests, mountains and river on the either sides</li> <li>• Legal services was adopted i.e.; the Fire Service Act- Sec.8 Powers of the Fire Emergency service and other persons for the suppression of fire</li> <li>• Best practice was to divide the mela in zones and providing additional SP rank officers and the mela being commanded by DIG rank officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Hotspot training sessions can be conducted , regular interaction with the media, reducing the stress of the jawans by providing welfare programs</li> <li>• Monitoring the event with CCTV camera, and drone (unmanned vehicle)</li> <li>• Mock exercise to be conducted for the capacity building</li> </ul>

7. Matha Naina Devi Ji Temple – Human Stamped - Mr. Dev Dutt Sharma IAS

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Unanticipated hazard and improper preparedness fueled the disaster leading to hue and cry</li> <li>• Delayed rescue operations due to inadequate infrastructure and road facilities</li> <li>• In stampedes the most vulnerable category were women and children</li> <li>• Learning from the incidence, various measures like registration of pilgrims, infrastructure, resourceful uses of technology and other similar steps were adopted.</li> </ul>	<ul style="list-style-type: none"> <li>• There was a suggestion that an institutionalized DM plan should be made and implemented in other places.</li> <li>• Chair remarked about the training necessity of temple authorities, volunteers including civil defence</li> </ul>

## 8. Crowd Management – Nabakalebara Rath Yathra, Odisha - Mr. Binyanand Jha IPS

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Non-flexibility of rituals is a huge challenge in crowd management related to religious functions</li> <li>• Extensive use of electronic technological advances and media</li> <li>• Capacity building and probable anticipated crowd gathering places</li> <li>• Arrangements for free flow of ambulance got the appreciation of Prime Minsiter</li> </ul>	<ul style="list-style-type: none"> <li>• Centralized control room where all forces deployed were on command, was the effective measure, shall be replicated.</li> </ul>

## 9. Crowd Management – Shri. Mata Vaishnno Devi Shrine Board - Dr. M.K Kumar

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• The major challenge in this case is a weathered hill terrain with limited capacity for performing darsan coupled with ever increasing pilgrim numbers</li> <li>• 24 x 7 darsan time and equal distribution of facilities like food stalls and other services help to avoid gathering of crowd</li> <li>• Prediction of pilgrims flows are done through decentralized process of registration and other technological services</li> </ul>	<ul style="list-style-type: none"> <li>• Supervision of whole ecosystem in order to make the pilgrims and environment least affected</li> <li>• Map preparation to find out choking points and real time communication shall be done</li> <li>• Special arrangements for elderly and women along with strengthening the health facilities shall be done</li> </ul>

## 2.2 Day 2 - 12<sup>th</sup> July 2017 | Abstract of Presentations & Suggestions.

### Technical Session III - Planning & coordination

10. Development of Crowd Management Plans-Railway Perspective - Prof. Sanjay Tripathi, Indian Railway Institute of Transport Management

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Shared the experiences from Allahabad railway station during KumbhaMela, where challenges – unauthorized entries are high and the women and children are identified to be more vulnerable in the situation</li> <li>• Identification of high risk areas mainly the narrow ways like bridges and sub ways and upgrading the facilities</li> <li>• Effectiveness of system is acquired through the collaboration with the other entities and forces.</li> <li>• Control towers were established for</li> </ul>	<ul style="list-style-type: none"> <li>• Crowd management planners and crowd control authorities should be there in place.</li> <li>• There is a different experience with new railway stations in Mumbai, where crowd management is efficient, at the same time, the crowd management strategies and facilities are not getting effective at some other stations.</li> </ul>

<p>centralized monitoring, control and coordination for security arrangement, crowd management and traffic movement</p> <ul style="list-style-type: none"> <li>• Crowd Facilitation activities were implemented and results were impressive</li> </ul>	
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11. Role of police and NDRF in crowd management - Mr. Sandeep RaiRathore IPS, Inspector General of Police, Tamil Nadu

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Role of police in crowd management is critical in preventing casualties as well as maintaining law and order situation.</li> <li>• Implementation of regulatory powers and penal powers</li> </ul>	<ul style="list-style-type: none"> <li>• Application of guidelines of NDMA should be tested and modified. Noted that some of them are only theoretical</li> <li>• Making the people more flexible to SOP and directions given by forces through education.</li> <li>• The documentation of more number of events and case studies is very necessary.</li> <li>• Database for case studies and lessons learnt shall be kept.</li> </ul>

12. Role of Civil Defense, NGOs, CSOs, in Mass gatherings/events –G.S Saini, VSM, Director NCDC, Nagpur

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Classification of the crowd according to their behavior.</li> <li>• Civil Defence is an important component in the case of crowd management.</li> </ul>	<ul style="list-style-type: none"> <li>• Necessity of pre-event planning and flexible administrative powers should be given to the people who were in charge of scene</li> <li>• Public health issues and garbage disposal along with enough sanitation facility must be taken care of during a crowd gathering event</li> </ul>

	<ul style="list-style-type: none"> <li>• During emergencies, Civil Defence has been an adequate force that provides guidance and assistance in preparing for, responding to and recovering from a disaster, hence, all the states shall form Civil Defence force formainstream to the existing system.</li> </ul>
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13. Medical preparedness and plan for mass gatherings/events - Dr. Anil V, Assistant Director Public Health, Kerala

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• High population density and the risks in Kerala is explained</li> <li>• The role of community during an emergency situation to improve effectiveness of health services was explained with the example of Puttingal Fire cracker incident which happened in Kerala</li> </ul>	<ul style="list-style-type: none"> <li>• All Govt. hospitals, primary health centers and private hospitals are strengthened in the buffering areas</li> <li>• More medical out posts should be opened and medical staffs should be deployed in the event area</li> <li>• Pre planning meetings should be held 3-4 months before event with all concerned stakeholders.</li> </ul>

#### Technical Session IV –Safety standards – Fireworks and use of animals in Festivals

14. Safety in fireworks Operations/Pyrotechnic works - Mr. S Kandaswamy, Deputy Director, Explosive, PESO (Petroleum & Explosives Safety Organisation), Kerala

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Discussed about the existing rules and regulations in using explosives in public and houses with respect to the two worst experiences of fire accidents by crackers from Sivakasi (2012), Puttingal (2016) were analyzed and where in illegal storage of fireworks were envisaged.</li> <li>• Legal provisions and criteria for license, authorities, restrictions strongly</li> </ul>	<ul style="list-style-type: none"> <li>• It is necessary to conduct awareness camps for firework labourers, and the public to avoid the encroachment of safety distance (100 m) as well as mandatory provision for blast walls for preventing fire accidents in workshops. And the crowd control failures make more causality.</li> <li>• Safety measures should be taken care of</li> </ul>



<p>recommending model firework factories.</p>	<p>safety distance of premises from public and other infrastructures, personal safety procedure for labourers, and important directions to handle the chemicals.</p> <ul style="list-style-type: none"> <li>• Violation and ignorance of safety rules pave way for disasters, here is explosives act 1884 and 2008. It is mandatory to conduct inspection with proper check list.</li> </ul>
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15. Crowd Management in festivals using Animals (Thrissur Pooram) - Dr. A Kowsigan IAS, District Collector, Thrissur, Kerala

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Public display of fireworks and parading of elephants are prime features of Thrissur Pooram</li> <li>• Unexpected animal behavior can trigger crowd disaster in such festivals</li> <li>• Measures are taken to ensure that animals are not provoked and they are kept calm throughout the Pooram festival proceedings</li> <li>• Usage of various equipments such as body chain and long stick minimizes the degree of violent behavior of the elephants</li> <li>• Flat terrains are the most preferable ground profiles for the placement of elephants</li> </ul>	<ul style="list-style-type: none"> <li>• Elephant are to be protected under the Wild Life Protection Act, 1972, especially rule 10 &amp; 11 emphasizes on maintaining the welfare of the animals from violation and crowd hazard related issues</li> <li>• Health monitoring of the animals envisaged/engaged in the festival gatherings plays a vital role in avoiding signs of Musth of the animals</li> </ul>

## 16. Coordinating Sabarimala Pilgrimage - Mrs. R. Girija IAS, District Collector, Pathanamthitta, Kerala

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• The presentation also indicated that the efforts, communication and operating system established and maintained by the DDMA to handle the crowd at the largest religious gathering in south India, the Sabari Mala</li> <li>• Inadequacies related to transportation and road network facilities and of parking, infrastructures, proper planning are potential challenging issues prevailing over here</li> <li>• In the years of 1952, 1999, 2011, 2013, 2016, various disasters occurrence apart from crowd related, narrates the disaster history and vulnerability of the area</li> <li>• The DDMA of Pathanamthitta, envisaged several projects for waste management, plastic management system and administration, emergency medical center etc. also a voluntary organization working for pollution control at place.</li> <li>• The liaison of essential departments like police, fire and safety, TravencoreDevaswam board, Electricity board, Kudumbasree community organizations, panchayathsetc.</li> </ul>	<ul style="list-style-type: none"> <li>• Being as critical geographical area especially covered by forest the chances for accidents are very common, special project named as 'safe zone Sabarimala' working for transportation/vehicle related assistance. (Best practice)</li> </ul>

## Technical Session V –Cross Cutting issues

### 17. Use of Technology in Crowd Management - Mr. Vinod K Boggarapu, IBM

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Today's emergency management challenges are mainly of two categories a) Human &amp; b) Environmental. The traditional approaches are replaced by the modern and smarter approach in crowd control</li> </ul>	<ul style="list-style-type: none"> <li>• Real-time monitoring is possible with the use of modern technology in crowd management</li> <li>• Many technologies and activities need to be integrated to create a smarter environment to mitigate crowd related disasters</li> <li>• Integrate multiple data sources to provide a single, consolidated operational picture across entire city or region from video analytics, sensors, prediction etc.</li> <li>• Incident and emergency management solution can achieve 90% situational awareness in only 30 seconds by establishing a geospatial common operating system, providing interactive planning and incident response implementation</li> <li>• Using intelligent video analytics to improve public safety, improve the ability to understand and respond.</li> <li>• Command and control centre architecture with multi-channel access, programming models shall help in intelligent crowd control</li> <li>• Intelligent video analytics can be used to improve public safety and thereby mitigate the risk of stampede and other crowd related hazards</li> </ul>

## 18. Role of Media in Disaster Management - Mr. VenkiteshRamakrishnan, Frontline, The Hindu

Abstract of the presentation	Proposed Action Points
<ul style="list-style-type: none"> <li>• Media plays an important role in dissemination of the information of the actual facts in an event of a disaster. However, media can also play a negative role</li> <li>• As disasters do not carry any commercial value, media houses are not interested to be engaged. Disaster management professional should strategize to bridge this gap</li> <li>• Efforts should be made by the journalist to provide factual information to the public after filtering the rumors/unscientific predictions whatsoever</li> <li>• Media houses through their sincere efforts can make disaster risk reduction a priority in their publishing</li> </ul>	<ul style="list-style-type: none"> <li>• Media persons/journalist should be aware about the basics of disaster risk management</li> <li>• Media usually comes into picture only when there is an event of disaster or emergency, but Media can play an important role in the pre – disaster phase by giving awareness messages.</li> <li>• Social media shall be used widely as an important platform to converge the relief activities, Chennai floods is an example of it</li> <li>• Disaster management is a cross cutting issue, which cuts across political/economical/environmental/human rights issue and hence the fourth estate can play a critical role in mitigating the disaster risks also</li> </ul>

### 3 Concluding Session

The concluding session was graced by Hon'ble Minister for Agriculture, Kerala who is also Member of Kerala State Disaster Management Authority. In his concluding speech, he highlighted the need for an integrated approach towards crowd management. His speech reiterated the need to address the religious and cultural aspects of the nature of the crowd when attempting to manage them. He shared his experience of being an organizer of Thrissur Pooram for the last many years.

Dr. V. Thiruppugazh IAS, Joint Secretary (Policy & Plan), NDMA summarized deliberations of the two day workshop. Mr. R K Jain IAS (Retd.), Member, National Disaster Management Authority, Mr.Subrata Biswas IAS, Additional Chief Secretary, Home and Vigilance and Member, KSDMA and Mr. P.H Kurian IAS, Additional Chief Secretary, Disaster Management addressed the audience.

#### 3.1 Summary of the workshop

Dr. V. Thiruppugazh IAS, Joint Secretary (Policy & Plan), NDMA summarized deliberations of the two day workshop. The talk is transcribed as below.

Crowd control is not new. In the ancient Egypt, before 3000 years, to contain and control the crowds in the large public squares they used barricades. The crowds used to break those ropes and barricades. Then the kings ordered preparation of metal ropes and the priests consecrated them and called them sacred cables so that the people won't break it. James Surowiecki's book "The Wisdom of Crowds" identified three important issues with regard to crowds- the problem of cognition, coordination and cooperation. If we want to tap the wisdom of the crowd- then we need to look at these three aspects. The presentations made here brought out all these aspects very well. Recognition of the problems, coordination with the crowd and also with the various agencies working for organizing the event, the third is eliciting cooperation from the public who gather.

Crowd related disasters are entirely man-made. They can be avoided and should be avoided. With better planning, preparedness and stakeholder involvement crowd related disasters can be avoided. The following are the excerpts from the discussions.

1. We cannot prevent the mass gathering of people - it is their democratic right. We should respect the public sentiments and opinions and manage the events. In the name of public good we cannot stop such gatherings. There is a need to balance the public good and public opinion
2. The need to have proper multi-hazard, vulnerability and risk assessment of the site in which events are planned
3. While undertaking the assessment the possibility of natural disasters occurring in that area should also be taken into account.
4. The risk of using explosives, fire crackers, and animals

5. Increased use of technology for crowd management in areas such as surveillance, monitoring, information dissemination, RFID, bio-metric registration, scanning of baggage, and communication
6. Need to focus not only on the physical aspects of planning but also understand the psychological aspects of crowd management
7. Planning and execution of the event should be inclusive -the special needs of women, children, disabled and old people should be given attention
8. The need to focus not only on the site of the event but also outside the event, even on the other districts and transport routes
9. Planning to focus on four important questions- What, When, Who and How and focus on prevention and mitigation
10. Having mock drills and adequate preparedness for response, creating holding and staging areas, emergency operation centres
11. Making a realistic assessment of the crowd for preparedness
12. Incident Response System should be adopted
13. Rigidity on the part of the priests, temple authorities and the need to strictly adhere to the rituals and customs. This is not only in India, if you read about Haj Crowd management, we will know there is a debate between Islamic crowd management principles and modern crowd management principles
14. Other challenges posed by the terrain, lack of space, lack of transportation facility and weather
15. Existing legal provisions and Acts and making use of the same and ensuring enforcement of the same
16. Responsibility and accountability of the government and event organizers
17. The question of carrying capacity and managing inflow and outflow accordingly
18. Need to have an effective evacuation plan
19. Living with the reality of VIP culture- Nobody likes VIP culture until he gets VIP treatment
20. Need for third party evaluation and independent feedback
21. Land use and special planning- need for eco-sensitive planning- restriction of plastic
22. Removal of obstructions and encroachments
23. Focusing on infrastructure- roads, bridges, drainage, sanitation, drinking water, light and health facilities
24. Having different strokes for different folks- which means handling different types of crowds- all crowds are not the same- sports crowd, crowd in musical event, political gathering and religious gathering are different and they need to be handled differently
25. Need to have SOPs which are context specific
26. The need for proper documentation, building institutional memory and not rely only on officer's memory
27. Testing of the NDMA guidelines and conducting sample surveys
28. Need to have more case studies
29. Having adequate human sources, actively taking the help of volunteers, private security

30. Issue of up-scaling railway services for crowd related events
31. Discussed the explosive acts and rules
32. Maintaining safe distance, obtaining licences to store fire arms, having authorized storages, proper crowd control is necessary for using fire works
33. Need for onsite and offsite plan while fireworks are used
34. Need for ensuring good behaviour from elephants and the ways of selecting happy and relatively calm elephants
35. Use of animals and behaviour of animals to be included as one of the triggering points in the guidelines
36. Checking unauthorized storage of LPG cylinders by hotel owners
37. Integration of various technologies and systems to create a smart environment to manage the event
38. Crowd sourcing of information can be effectively used to manage the events and collating data for decision making
39. Taking counter measures to overcome monitoring fatigue though intelligent video analytics
40. Commercial interest of the media in covering crowd related events
41. Media specific workshops to orient and train them
42. Integrating the commercial interest of media in DM plans and crowd management events

## 3.2 Closing remarks

Mr. R K Jain IAS (Retd.), Member, National Disaster Management Authority delivered the closing remarks.

Crowd management, in context of averting or minimizing crowd related disasters, is indeed a matter of contemporary relevance and of great concern. As Kerala is one of the states where several events of mass gathering of national significance are held regularly it was felt to hold this conference in Kerala itself.

The broad aim of the conference was to bring to focus, varied issues relevant to efficient crowd management and knowledge sharing to avert or minimize crowd related disasters in the country. The conference was structured to get experts and experienced hands in organizing events of mass gathering such as Haridwar and Nasik Kumbhamelas.

Presentations and discussions that in many places innovative steps have been taken. Efforts are being undertaken to manage the large events without any problem. State governments and DDMA's are keen to learn from each other.
















It needs to be appreciated that with passage of time, the complexity and enormity of managing events of mass gathering will increase manifold. The issue of security and terrorism will further compound our challenges, as is evident from the unfortunate incident in the Amarnath Yatra. He further pointed the need to be very imaginative and innovative in evolving the future strategies to mitigate the risk of crowd related disasters.

NDMA would like to compile all the important recommendations and lessons learned from various crowd related disasters in the past, across the nation and make these available to all the stakeholders. NDMA intends to constitute a committee of experts to revise the existing guideline in a very comprehensive manner.

NDMA, as you are aware conducts mega mock exercises and also train the administration in Incident Response System. NDMA is thankful to the KSDMA and the government of Kerala for their enormous support in conducting this seminar. I must acknowledge that Kerala has emerged as one of the leading states in disaster risk management and there is a lot to learn from the state.



## 4 Glimpses of the event

		
Hotel Samudra (KTDC)	Minister for Revenue & Disaster Management Mr. E. Chandrasekharan	Minister for Revenue & Disaster Management meeting Members of NDMA
		
Minister for Revenue & Disaster Management meeting Members of NDMA	Minister for Revenue & Disaster Management visiting the exhibition	A display model of Soil Piping
		
Minister for Revenue & Disaster Management visiting the exhibition	Members of NDMA with Hon'ble Minister	Minister for Revenue & Disaster Management lighting the inaugural lamp
		
Welcome to Hon'ble Minister for Revenue & Disaster Management	Mr. E. Chandrasekharan, Hon'ble Minister for Revenue & Disaster Management	Mrs. Nalini Natto IAS, Chief Secretary, Kerala
		
Mr. R.K Jain IAS (Rtd), Member NDMA	Mr. P.H Kurian IAS, Additional Chief Secretary, Disaster Management	Adv. V.S Sunil Kumar, Hon'ble Minister for Agriculture, Kerala

		
Mr. Subrata Biswas IAS, Additional Chief Secretary, Home	Mr. Loknath Behra IPS, State Police Chief, Kerala	Maj. Gen. Dr. V.K Naik, KC, AVSM (Rtd), NDMA
		
In Honour of National Anthem	Mr. A Hemachandran IPS DGP & Director General, Fire & Rescue Services, Govt. of Kerala	Brigadier Michael A. J. Fernandez, Station Commander, Pangode Military Station, Thiruvananthapuram
		
Mr. Sandeep Rai Rathore IPS, Inspector General of Police, Coastal Security Group, Tamil Nadu	Dr. Pavan Kumar Singh, Senior Research Officer, NDMA	Mrs. R. Girija IAS, District Collector, Pathanamthitta, Kerala
		
Prof. Dr. Janki Andharia, Dean, Jamsetji Tata School of Disaster Studies, TISS	Dr. Anil V, Assistant Director (Public Health), Directorate of Health Services, Govt. of Kerala	Mr. G.S Saini, VSM Director, NCDC Nagpur
		
Discussions		

		
Dr. K. Ambady IIS, Director, Public Relations Department, Kerala	Dr. A. Kowsigan IAS, District Collector, Thrissur	Mr. Kantha Swamy, Deputy Director, PESO
		
Col. V. Supnekar, Director, Centre for Disaster Management, YASHADA	Mr. Dev Dutt Sharma IAS, Special Secretary (Revenue - Disaster Management)	Mr. Binyanand Jha IPS, Additional DGP, Law & Order, Govt. of Odisha
		
Mr. Venkitesh Ramakrishnan Senior Associate Editor, Frontline	Dr. M.K Kumar, Addl. CEO, Shri. Mata Vaishno Devi Shrine Board	Dr. Sekhar L. Kuriakose, Member Secretary, KSDMA
		
Mr. Vinod Kumar Boggarapu, IBM Watson IOT	Prof. Sanjay Tripathi, Indian Railway Institute of Transport Management	Master of Ceremony, Ms. Anupama N, Hazard Analyst
		
Mr. Sathyajeeth Rajan IAS with Member, NDMA	The dias	Minister for Revenue & Disaster Management with officers of KSDMA



Moments