Mass Gathering Event Management

A Case Study of MahaKumbh, 2013, Allahabad

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बिहार सरकार

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Abstract

Maha Kumbh Mela, 2013 was a religious festival where people from across the country gathered over a period of 56 days in the holy city of Allahabad. During the period, the devotees took a holy dip at the confluence of the sacred rivers Ganga, Yamuna and Saraswati, referred to as *Sangam.* Since the mela is believed to have taken place once in many hundred years based on the astrological events, the turnout at the Mela was huge. Nearly 100 million people visited the place in the short duration. Many of them stayed in a relatively smaller temporary settlement of around 58 square kilometers. The plethora of arrangement made by the administration, the civil society and the people themselves calls for immense planning, perseverance and dedication. With a single-day population crossing 30 million on a festival day, any mass casualty could just not be averted if the administration was underprepared.

The present study, a case study of Maha Kumbh, 2013, aims to get into the details of the operational planning that went into the preparation of such mega event. It also aims to outline the good practices at the field level that could be adopted by the other states and the countries all over the world in terms of planning for any mass gathering event.

This study would examine good practices and gaps in overall management of the event and derive useful recommendations for organizing similar events in the state of Bihar and other parts of the country.

Key Words: Mass Gathering Event, Crowd Management, Disaster Management, Kumbh Mela,

Acknowledgement

A detailed study of one of the largest events on the planet in terms of identification of good practices, the failures, the success stories and takeaways requires a quick decision, an able leadership and a vision to replicate the new and successful ideas. Hence, the Bihar State Disaster Management Authority (BSDMA) expresses its sincere thanks to Shri Anil. K Sinha, IAS (rtd), hon'ble Vice Chairman, BSDMA, whose constant inspiration and encouragement led it to undertake this study. We will also take this opportunity to thank Shri Anil Sinha, BAS, and P.S to Vice Chairman, who has been a moral support to the whole idea. The Authority extend its gratitude to Shri S.S. Guleria, Commandant, NDRF, 9BN and his team, who extended all possible operational and logistical support during the data collection phase.

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1. Introduction

a. Problem Statement

India is a country of many religions, faiths, festivals and events. Owing to its around 1.2 billion populations, there are mass gathering events being organized at various levels involving large number of people. In such situations, governments and administration seem to be struggling to make fool proof arrangements for such events. Due to unforeseen circumstances, there have been many unfortunate incidents happening causing loss of lives, damage of property, mental agony etc. However there are some good practices adopted by governments in organizing such events. The research aims to identify such practices and put them in a form that is replicable in other such events.

b. Significance of the problem

In large congregations, many people go missing, and in some cases die in instances such as stampedes, fires and collapse of buildings. For example, during 1997 and 2005, several hundred Hajj pilgrims died of fire or stampede (Yamin, 2005). The things have been no different in Indian perspective. The table below shows some of the major mishaps that caused people loss of lives and damage to property.

Date	Place	Trigger	Injured	Dead	Source
26th Aug, 2003	Ardh Kumbh Mela, Nashik	Chaos while looting silver coins thrown at crowed	57	39	The Hindu
25th Jan, 2005	Mandra devi Temple, Maharashtra	Electric Short Circuit leading to blast	Not Available	300	The Hindu
18th Dec, 2005	Relief Distribution, Tsunami, TN	unorganized relief distribution	37	42	ToI
3rd August, 2008	Nainadevi temple, HP	Rumor of Landslide	47	162	ToI
30th Sep, 2008	Chamunda Devi Temple, Jodhpur	Rumor of Bomb Blast	60	150	ToI
14th April, 2010	KumbhMela, Haridwar, UK	Car lost control creating chaos in crowd	17	9	ToI
18th Nov, 2012	ChhatPooja, Patna	Rumor of live electric wire falling in water on Ganges Ghat		17	

Table 1: Past Mass Gathering Incidents

Figure 1: Mauni Amawasya

Now when we look at each of the incidents, and their causes, we find it that a small trigger can cause huge impact. Many of the incidents were caused by something that could have been prevented very well. Also, these incidents took place at the place where there were huge crowd gathering. There is always a possibility of mishap at such gathering. The worst affected people are elderly citizens, women and children. The record shows that these groups of people form the major chunk of affected population and in year 2008 alone, 325 people lost lives in such incidents. A planned effort in such congregations, if precautionary and preparedness steps are taken, the lives can be saved.

c. Background of the problem

With a population with over 1.2 billion people, India is world's second most populated country with some of the areas with highest population density. It can overtake china by the end of the decade. At the same time India is also a land of diverse people, language, culture, creed, caste, religion, geographies, climatic conditions and economy.

Different regions, religions and faiths have their own ways of celebrating their festivals. Generally these celebrations end up becoming an event of mass gathering. These events are observed with large number of turnouts, within a short span of time in a very limited space with limited resources. With such events, it becomes imperative for the governments to get involved and make arrangements to keep the events as smooth as possible. They need to prepare themselves according to all aspects of Disaster Management, mass casualty management, media relations, security of people, care for vulnerable groups etc. If the events see turnouts in many thousands and millions, there has to be a proper planning for it. There is a

huge surge in the demands of consumable and infrastructure. Many of such infrastructural developments need huge investments and they also need to be justified against the safety, sustainability and effectiveness. Hence the planned exercise has to be logically executed without burdening the people, the place and the existing infrastructure. There have been significant technological advancements in last few decades in terms of communication and security. The geospatial and satellite technologies, RFID and other tracking mechanism along with advanced computer systems have made it easier to manage any event, track people and help make a planned effort towards event management.

Kumbh Mela is generally acknowledged to be an event that is organized in a traditional mode. With almost 10 million people gathering in an area of less than 60 square kilometers, it becomes difficult for the organizers to take care of needs of every single citizen. This is similar to establishing and running a whole new city for a short period with all amenities. But a careful examination of the activities that had been planned and executed at the Maha Kumbh 2013 shows that the government had taken many innovative steps and planned efforts with involvement and incorporation of trained human resource and technology. Looking at the various such events that are being organized worldwide such as Haj, we find that there are many systematic efforts with incorporation of technology, involvement of efficient human resources and infrastructures have been made to make the events a disaster free event.

d. Objective of the study

The overall objective of the research is to derive the good practices adopted during the Maha Kumbh Mela, 2013, identify the gaps in planning and lesson learned. India witnesses large number of religious and cultural festivals that, many a times, mark their observance in large numbers (RathYatra at Puri, DurgaPooja, Ramzanetc). Thus it becomes imperative for the administration to plan these events in a way to reduce any unprecedented incidents. The experiences from pasts have shown that any flaw in planning could result in widespread panic and deaths. Thus this research will be dedicated to lessen the same in the future events by developing a model plan of action for mass gathering events.

e. Rationale of Study

The most basic rationale that can be put forward in the given premise is its ability to replicate in many of the mass gathering events in India. The similarity in infrastructural requirement, the crowd behavior, the turnout of events etc. make this study worth being undertaken. Various governments plan such events, implements strategies and execute them on the ground with partial, no or total success. In view of such planned effort already made, the study will supplement the event planners, the governments at various levels of administration to keep note of the important sub-events and to minimize failure at any point of the event.

2. Literature Review

Event of Mass Gathering

An event of Mass Gathering is generally characterized by huge number of people accumulating in a very limited space in a short span of time. Such events, though observed within a limited time, sometimes attract a crowd, many times the total population of the city. Kumbh Mela, 2013 is estimated to touch a whopping 10 crore mark[1] . Some of the key issues that have been identified during such mega events are associated to the following (Frykberg, 2003);

- Disaster management planning and rehearsal

- Integration of local, regional, and national resources into a disaster management system

- Hospital Emergency Incident Command Systems (HE- ICS)

- Communications and security

- Media relations

- Protection of service delivery personnel and facilities

- Detection and decontamination of biological, chemical, and radiation exposure

- Triage principles and implementation

- Logistics of medical evaluation, stabilization, disposition, and treatment of victims

- Record-keeping and post disaster debriefing, critique, and reporting

- Critical incident stress management (CISM)

- Published research and experience in disaster management

Such events involve a number of stakeholders including event organizers, tourism practitioners, policy makers, event volunteers, risk, emergency and security forces, emergency management and business continuity practitioners, professional associations, community partners and relevant stakeholders, with the government administration emerging as the biggest player (Kishore, 2012). With so many stakeholders involved, a survey research conducted during one such event revealed the following challenges (Kishore, 2012);

- Safety and Security

- Crowd and Group Behavior

- Lack of Public Awareness and Education

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[1] According to article "MahakumbhMela: On the banks of Sangam" by PrashantPandey, published in The Indian Express on 06 Jan, 2013

- Impact of Social Media

- Likelihood of injury or death

- Disease outbreak

- Damage to property and environment

- Public image

Though some of the issues identified are not relevant to Indian context, most of them, remain a challenge throughout the world irrespective of culture and nature of event.

While issues related to food, water and sanitation, environmental, physical and technical hazards, epidemiological and infectious disease surveillance and health promotion are some of the most important aspects, the perspective of event planning and management in context of public safety, risk assessment, drug and alcohol control, excessive use of force by administration/authority, weather, structural failure, riots, disease outbreak, casualties and injuries, mob mentality etc. are key areas where strict and prompt actions are required.

Sustainable efforts

Provision of urban services, facilities and infrastructures, referred to as one of the most demanding challenges facing contemporary urban planners and managers (Kammeier, 2008). In his paper, Kammeier refers to the changes brought about by these mass gathering events that are temporary in nature as 'pulsar effects'. Examples from global meeting of IMF in Bangkok few years ago, where school children were given five days holidays and business were asked to shut down and Beijing Olympics 2008 that underwent a resettlement of nearly 3.5 lakhs people, show that government takes temporary measures to cope with the immediate effects of temporary special event. But at the same time, there is a pertinent question whether these efforts are needed and are sustainable?

Special events always require special management measures, including non- routine investments of public resources, in order to cope with the special events that are usually short-term as such but may have potential for longer- term benefits. The conditions of 'pulsar effects' may lead to serious imbalances between public and private investments and their efficient and equitable use for certain periods of time and in certain areas. The challenge is to avoid such imbalances or, once they occur, to manage them in the best possible way. There is enough evidence that this can be done, but it requires very capable management (Kammeier, 2008).

The perspectives of special and temporal dimensions and the associated cause and effect chains are common across all such events. So the key questions that need to be answered first are the following;

1. How should the planners cope with the pulse events?

2. Does our traditional focus on spatial planning adequately equip us to respond successfully to peak and recurrent demand in a context where the time dimension is uncertain, unexpected and unpredictable?

3. How should we deal with the post- event situation – the 'hand-over' syndrome – when the city has to return to normality?

4. Who are the other players in coping with pulsar effects?

5. If that traditional focus is inadequate, which are the important skills to be utilized or developed?

6. Whatever is defined as 'normality', do we not need a method for distinguishing routine events from more special and truly unique events? And

7. Must we not consider the preparatory phases as much as the 'hand-over' or 'aftercare' aspects?

Speaking of the sustainability of such events, the planning and management can vary from deep green ecological fundamentalism to energy conservation or social equity, environmental economics to reasonably long amortization periods of major public private investments (Kammeier, 2008).

Technological Innovation

Many of the problems in the management of large and crowded events, especially those of religious nature, are associated with the movement of people. This poses many challenges (Yamin, Huang, & Sharma, n.d.). These movements need to be strictly monitored and controlled to keep the even organized.

The activities and behavior of crowd cannot be forecasted or determined. It is just through the vigilance that they can be monitored. The task may include managing and administering many activities such as checking and controlling traffic movements, payment of toll taxes, and monitoring and managing patients, parking, monitoring the overall law and order, incident reporting and incident response. Thus, role of technology becomes very crucial.

Kumbh Mela

Management of large events like that of Hajj or Kumbh is very complex exercise. Ironically many of the large events are religious in nature, which make their management even more complex. Hajj, for example, is a unique annual gathering of its kind, which attracts millions of devotees to Mecca and its surrounding area, involving air, water and road transportation. The management of Hajj is a challenge mainly because its activities involve very large congregations and their movements in and around Mecca. Many of the problems in the management of large and crowded events, especially those of religious nature, are associated with the movement of people (Yamin et al., n.d.).

When it comes to organizing such events of mass gathering, KumbhMela is generally acknowledged as the one with tradition approach. India has seven sacred cities that receive millions of faithful Hindu pilgrims each year. The Kumbh Mela in one of the cities, Haridwar in Uttarakhand, seems to set the absolute record in numbers of visitors in a traditional pilgrimage event. Although the city of Haridwar (200,000 inhabitants) receives some pilgrims throughout the year, the Kumbh Mela only takes place every few years. In 1992, there were 5.5 million pilgrims in the four months of the pilgrimage season, but on the traditional peak day (14 April), there were 2.6 million visitors in Haridwar, in order to bathe in the sacred Ganga river (Sravant, 1997). The record numbers for the special year of 1998 were estimated at 10 million in four months, and 4.6 million on the main festival day, 14 April. Although the city has some fixed infrastructure and guest houses to cope with the normal 'low tide' of visitors, almost the entire infrastructure for the big event consists of temporary and ad-hoc arrangements – accommodation, sanitation, food, transport, and the scheduling around the ritual bathing 'ghats' by the river. For each of the Kumbh Mela years, this implies standards that are barely at the survival level of a refugee camp, and great risks like the epidemics, fires, and stampedes where hundreds of people may die (Kammeier, 2008).

The whole of the Maha Kumbh Mela event management can be divided into following sections (Harvard

Global Health Institute, 2012);

1. Mass Gathering and health
2. Religion and religious pilgrimage
3. Disease, health food and food security
4. Urbanization and design engineering
5. Communication technology
6. Business trade

Each of these areas is quite substantial and they deal with a plethora of associated activities.

<u>Mass Casualty Management</u>

An event of Mass Gathering dealing with crowd management also associates itself closely to Mass Casualty Management. Mass casualties after disasters are characterized by such numbers, severity, and diversity of injuries that they can overwhelm the ability of local medical resources to deliver comprehensive and definitive medical care to all victims (Frykberg, 2003).

An effective Mass Casualty Management Plan requires an establishment of base line, that is, an assessment of current system's capacity against which planned changes can eventually be measured. A

second key initiative should be taken to provide a detailed understanding of the hazards and risks specific to the country. Emphasis should be placed on gathering retrospective data on previous incidents. This should not be limited to large-scale disasters but also to those of smaller scale such as major traffic or industrial accidents, mudslides or floods that do not require national intervention, fires and building collapses, and so on. It should also include a forward-looking component assessing risk in the future from elements such as unsafe urban development, or changes in weather patterns. Coupled with the baseline assessment, the information provided by this hazard analysis and risk assessment will provide a solid basis for the subsequent process of planning, and for the allocation of resources. This will help in development of a comprehensive Mass Casualty Management Plan (WHO, 2007).

This also necessitates the development of training modules and guidelines, monitoring, surveillance and early warning, stockpiling, collaboration with NGOs and corporate sectors as partners and thus finally developing a culture of community preparedness (WHO, 2007). While addressing any mass casualty event, it is worth noting that Disaster management poses challenges that are distinct from normal practice. It requires a paradigm change from the application of unlimited resources for the greatest good of each individual patient, to the allocation of limited resources for the greatest good of the greatest number of casualties. This is achieved most effectively by planning and training for disasters, through both internal hospital drills and regional exercises involving all community resources. Rescue, decontamination, triage, stabilization, evacuation, and definitive treatment of casualties all require the smooth integration of multidisciplinary local, state, and federal assets. This would include (but not be limited to) pre-hospital services, the media, emergency management and public health agencies, transportation and communication resources, the military, and health care delivery facilities and personnel (Frykberg, 2003).

Development of Model

Disaster Management is an emerging field with many of its domain areas under evolution. Under such circumstances and in context of mass casualty management, the literature review fetched very limited results in terms of pre-existing model. One of such model was developed at Virginia and it was names as **Mass Casualty Incident Management: Virginia Model** (Green, 2000). It describes a system for response to a mass casualty management as needed to address both capacity and procedural issues throughout all the phases of the incidents. These phases may include;

- Preparedness
- The mass casualty event
- Response and characterization
- Patient clearance

- Transition to mass fatality incident, if required

- Short distance transport to definitive care

- Long distance transport to definitive care

- Patient discharge and return.

The Virginia approach consists of four modules. The first two comprise of the following;

1. Initial set of actions : Safety (assessment of safety of scene to determine entry of medical service resources), Size-up (rapid and quick assessment of overall characteristic of incident including size, area covered, severity, access routes and additional resources needed), Send (dispatch of resources), Set-Up (assumption of command), Start (start triage).

2. Second, the use of START triage was identified as the first step in actually determining the medical characteristics of the incidents.

3. Establish the organization of mass casualty response as a standardized Incident Command System, Medical Group under the leadership of a Group Supervisor, with Unit Leaders for Extrication, Triage, Treatment, and Transportation.

In the next step, a plan for coordination of health and medical response to catastrophe casualty events is developed followed by the final step of managing mass casualty incident where an action is needed when patients exceed the statewide system capacity.

3. Approach of the Study

a. Guiding Principles of the Study

i. **Objective of the project**: In the project studied, every objective to be achieved was right from the panning, management and execution of the series of events. This ensured that each and every perspective of the event was captured.

ii. **Expectations from the Stakeholders:** An event of such a large scale involves numerous stakeholders' right from the government administration, line department, the civil society organizations, the NGOs, the local corporate and private establishments. It becomes imperative to determine the expectations of each of the stakeholders from others, contributions made by each one of them, the suggestion for further improvement and an overall impression of the event.

iii. **Data:** The Mela concluded with a turning up of over 10 crore people. Mere imagination of the available data can explain the complexity of the study. The data coming from government administration, the essential services, and the line department mostly assumed a qualitative form. At the same time, the on-field data and inputs from other stakeholders were qualitative in nature. The general tool for data collection was structured questionnaire in case of quantitative data and for qualitative data it was in form of open ended semi-structured questionnaire and focused group discussion.

b. Framework of Study

Kumbh Mela is organized at various places in India in various capacities. In Allahabad, it comes once in12 years. Additionally Ardh-Kumbh is held once in six years. All these mass gathering events have turnout of huge population, involves development of pop-up cities and many allied services. The ever increasing population, the awareness and popularity these events gain from media and better connectivity between the places have been resulting in constantly increasing population with substantially large and difficult to determine population. This necessitates a need of a thorough analysis of previous event's data, gaps/shortcoming and the best practices evolved. The extrapolation of data based on the analysis of the previous event's data will help determining the needs at the present one.

Once the need assessment is done, the planners base their whole plan and management of the event with the assessed data. It is very important to determine how the assessed data is utilized in planning and management of the event.

Plan will be plans unless backed by practically implementable ideas. Once the planning phase is over, all the stakeholders come into the picture to coordinate and execute the event as per the plan. Thus it requires a multidimensional approach.

Post event analysis is crucial from point of view of determining the overall success or failure of the even management. It also helps figuring out the good practices, the gaps and lesson learned. Based on these collective data, an ideal model can be developed.
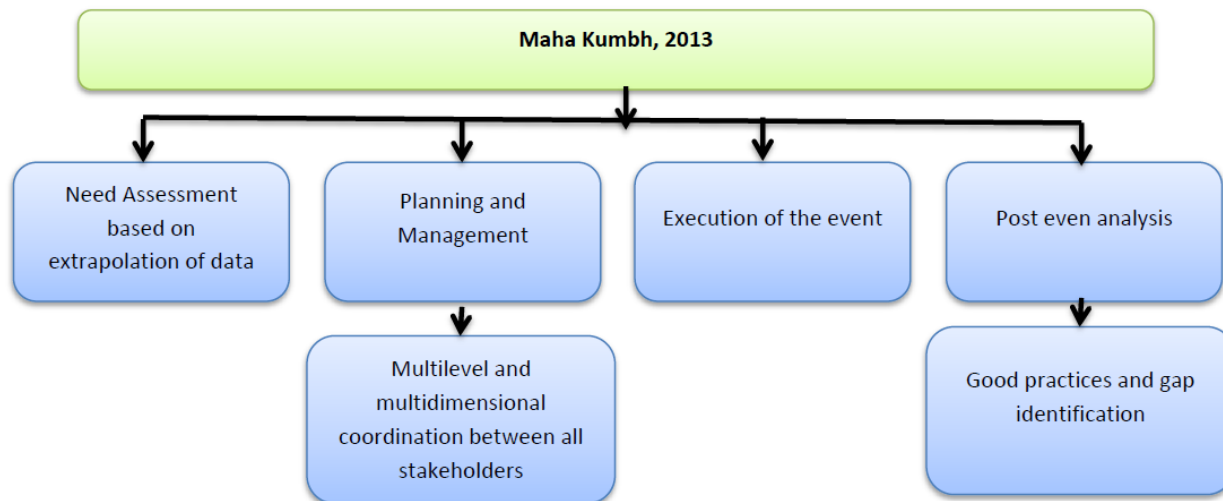
Table 2: Study Framework

c. Information Need Matrix

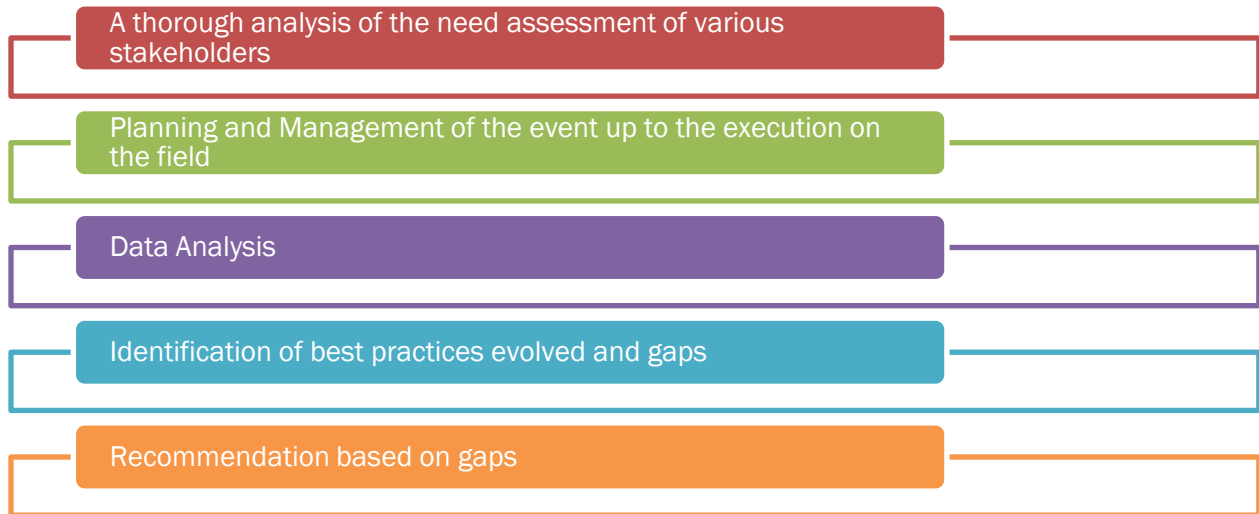Since it is a case study which is explorative in nature, it is very important to determine the source of information and the type of information needed. This will greatly be influenced by the availability of data, and the on-field situation. The need matrix is divided into the following categories;

- The government administration
- The line departments
- The essential services
- The NGOs and CSO's

4. Research Methodology

The basic objective of the research is to study the good practices adopted during the Maha Kumbh Mela, 2013, identify the gaps in planning and lessons learned. The study was conducted in the following sequence;

A thorough analysis of the need assessment of various stakeholders

Planning and Management of the event up to the execution on the field

Data Analysis

Identification of best practices evolved and gaps

Recommendation based on gaps

Table 3: Research Methodology

a. Research Area

The research area is the stretch of 58 Square kilometers of area (around 2000 hectares) along the bank of Ganges, Yamuna and their confluence known as Sangam in the city of Allahabad in Uttar Pradesh. The entire area is divided into 14 sectors and 99 parking lots.

b. Unit of Analysis

The primary units of analysis for the study were the departments under the government system and the other organizations playing a role in the planning, management or execution of the event. The smallest units of analysis were the individuals who held a post of responsibility or represented an organization.

c. Research Question

The study dealt with the following research questions;

1. How was Maha Kumbh, 2013 planned, managed and executed?

2. Based on the experience from the Maha Kumbh, 2013, and incorporating the good practices and addressing the gaps how can be an efficient model for mass gathering events in India be determined?

The first question clearly deals with the overall organization of the Maha Kumbh Mela, 2013. This will call for detailed study of planning and execution of the event and getting perspective and experiences from all stakeholders.

The second question is rather exploratory in nature and can be determined by the success/failure, the evolution of the practices and the gaps identified during the execution of the event. Once done, connecting all the loose ends and incorporating the best practices evolved, a model plan for such events can be determined. This model will be generic in nature and scalable at the same time.

d. Research Design

The study focusses on how the event has been organized and why has it been done that way2. At the same time, here has been no dedicated model developed for the efficient management of mass gathering events. Hence the research takes on an exploratory approach. Additionally, the behavior of the stakeholders involved cannot be manipulated. Hence, according to Yin (Yin, 2003), the present study qualifies for a case study design. It will follow a single case study design3.

e. Sampling

The study adopted a non-probabilistic purposive sampling in the case of Government Administration, the line departments and the essential service providers. The same in the case of private players, the corporate and the NGO/CSO was based on a mix of non-probabilistic purposive sampling and snow ball non probabilistic sampling method.

f. Development of Instruments

In case study research, the measurement instrument used to maintain consistent focus and a rigorous approach is the study protocol (Yin, 2003). The protocol is more than just a list of questions to be asked during data collection4. Yin suggests the following protocols that have been included in data collection.

- An overview of the case study project: Project objectives and relevant readings on the Mass gathering and crowd management along with mass casualty management were done.
- Field Procedures
- Case study questions: These questions were purely based on the subject area of the respondents.
- Guide for case study report: organizing data, putting them into a specific format and documentation.

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2 Yin, 2003: He mentions that case study is preferred strategy when "how" and "why" research questions are posed.
3Yin, 2003: Defines this case structure as type3.
4Yin, 2003: Page 69

g. Data Analysis

Once the data was obtained, the analysis was done by organizational level logic model (Yin, 2003). As explained by Yin (Yin, 2003), the logical model traces events taking place in an organization. The data analysis in this method should consist of tracing the actual events taking place in an organization with the close attention to the chronology of the event. So in the research, emphasis was given to the order in which the event was taking place (as explained by the interviewees) and their association with the preceding and the following activities along with other associated activities in the explanation.

5. Kumbh Mela

a. Planning

Kumbh Mela is a massive event attracting over 120 million of human population. Every time there are new challenges. The government's estimation about the influx of pilgrims needs to be near accurate. It was indeed a tough job for the planners to assess the data based on the previous year's Kumbh Mela and extrapolate the current estimated people traveling down by considering the factors such as population growth, infrastructure, transportation and road connectivity etc. The following were the factors considered for estimation of Pilgrim and Resource/Infrastructure Planning:

- Kumbh 2001 was for 44 days while Kumbh 2013 will be for 55 days (+25%).
- Country's population was 102.87 Crore in 2001, it is estimated to be 121.02 Crore in 2011 (+17.6%).
- The State population was 16.61 Crore in 2001 which has risen to 19.96 Crore in 2011 (+20%).
- Allahabad Nagar Nigam had 9.75 lakh population in 2001 which was 12.47 lakh in 2011 (+28%).

Figure 2: Kumbh Mela Settlements

Figure 3: Kumbh Mela was divided into sectors

Besides the total number of people expected to be there at the Kumbh Mela, it was further broken down in terms of specific festival days when the area would see a surge in population. Estimated Pilgrims during Kumbh 2013 were:

S. NO.	Bathing Days	Kumbh 2001		Kumbh 2013	
		Dates	Estimated Visitors	Dates	Projected Visitors
1	Makar Sankranti	14.1.2001	100 Lac	14.1.2013	110 Lac
2	Paush Purnima	09.1.2001	50 Lac	27.1.2013	55 Lac
3	Mauni Amawasya	24.1.2001	276 Lac	10.2.2013	305 Lac
4	Vasant Panchami	29.1.2001	175 Lac	15.2.2013	193 Lac
5	Maghi Purnima	08.2.2001	150 Lac	25.2.2013	165 Lac
6	Maha Shivratri	21.2.2001	50 Lac	10.3.2013	55 Lac

Table 4: Important days at the MahaKumbh

The allotment of land with tents and basic amenities were done right at the beginning of the mela (around December). The following were the basic amenities associated with all the settlements inside the Mela.

• Road

• Water Supply

- Electricity supply
- Visitors Shade
- Fire Shade (for winters)
- Toilets
- Bathrooms
- Kitchen
- Eateries
- Police
- Fire Service
- Primary Health Center/ First Aid centers

Once the area was earmarked for the Mela, plots were allotted to the registered organizations. This was done immediately after the water receded post monsoon in the previous year.

Other facilities provided are given in the table below.

PWD

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh - 2007	Kumbh-2013
1	Length of roads laid	Km	96.40	116.50	156.20
2	No of Pantoon bridges	No.	13	14	18

Table 5: PWD

Jal Nigam

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	Ardh Kumbh -2007	Kumbh-2013
1	KLs of Drinking water supply	KLs	56000	76000	80000*
2	Length of Pipelines	Km	340	458	550
3	No of connections	No.	15430	18523	20000
4	No of active tube wells	No.	28	38	40
5	No of OHT in operations	No.	2	2	5

Table 6: Jal Nigam

Food and Civil Supplies

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	Ardh Kumbh -2007	Kumbh-2013
1	No of ration cards issued	No.	127000	117481	200000*
2	Allotment of Wheat	MT	13500	10000	16200
3	Allotment of Rice	MT	7800	5000	9600
4	Allotment of Sugar	MT	5000	-	6000
5	Allotment of K Oil	KL	11000	6600	13200
6	PDS shops in the mela area	No.	107	107	125

| 7 | Allotment of milk | KL | 118 | 84.2 | 400 |
| 8 | Milk Distribution shops in mela area | No. | 106 | 98 | 150 |

Table 7: Food and Civil Supplies

Roadways

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh -2007	Kumbh-2013
1	No of Temporary bus stations	No.	4	4	5
2	No of buses in operation(Reg.)	No.	776	798	892
3	No of buses in operation(Spl)	No.	2824	2202	3608
4	No of Pilgrims	Lac	36.64	46.78	90.00*

Table 8: Roadways

Railways

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh -2007	Kumbh-2013
1	No of stations in operation	No.	7	Not Available	7
2	No of trains	No.	600	Not Available	750

Table 9: Railways

Irrigation

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh -2007	Kumbh-2013
1	Permanent Ghats	No.	0	0	4

Table 10: Irrigation

* - Approximate.

b. Innovative Initiatives

The following were some of the innovative initiatives taken up by the administration working restlessly for the Mela.

1. Administrative departments associated with Security and Public Amenities were set up as individual blocks.

2. A concept of Sector Market was floated in the Mela where each sector had its own sector market for making essential commodities available to the people.

3. Digitization of all the information related to the Mela was made available on website dedicatedly working for Kumbh Mela.

4. GPS Mapping of all the sectors, important offices and amenities available on the field.

5. Site cranes installed at all the state highways connecting Allahabad.

6. First Aid counters and Ambulances with life support systems on busy state/national highways connecting Allahabad.

7. Traffic police installed electronic variable signboard on the major roads so as to ease the traffic and display important messages.

8. Lost and Found camps used electronic techniques for effective functioning

9. In order to keep the place clean and keep the river clean, polybags have been banned in the area. This cleanliness drive was carried out with the help of CSOs and public.

10. Many of the private/corporate houses have been involved in providing services to the people at Kumbh Mela through their CSR initiatives.

11. Communication system further strengthened by enabling of WLL and CDMA services by BSNL.

Figure 4: Information and Public Relations Counter

c. Public Convenience

The study captured glimpse of some of the basic services that are very crucial to the people at Kumbh Mela. These services include public health, security, cleanliness, electricity, law and order, disaster management etc.

Figure 5: Display board showing helpline numbers

i.   Electricity Supply

The Mela demanded huge electricity for the entire period. The entire area was divided into 5 zones for electricity supply. There were altogether 52 substations with 2 transformers of 400 KVA each. There were also provisions of Mobile Transformers. These transformers were connected with 80 KM of 11KVA high tension wires and 2800 KM of low tension wires for supply of electricity in all the Akahadas and other camps at the Kumbh Mela. This was used to illuminate 24,000 street lights.

For the emergency situations and in order to avoid blackout, there was a provision of 15 generators of 125 KVA each and 30 generators of 63 KVA each.

Figure 6: Mobile Transformer

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh 2007	Kumbh-2013
1	KWh of power consumed(Load)	KWH	18 Mva	23 Mva	30Mva*
2	Length of electricity lines	Km	565	665	770
3	No of Street light Points	No.	16865	18000	22000
4	No of private connections	No.	69489	94000	130,000*
5	No of Substations in operation (various categories)	No.	49	62	73

Table 11: Electricity

The general consumption of electricity at the Mela was around 18 Megawatt. It was estimated to reach 30 Megawatt in the peak season. The department was however prepared for 40 Megawatt supply.

Figure 7: Street lights at Ghats

The innovation that the department has done this year is by providing additional safety. They have implemented such technology that stops the flow of electricity in the wire once there is a breach in wire through gauge operated switch.

ii. Police Control Room and Information and Communication Technology

The police control room housed the controls for CCTV and PA system. They had controls over 3000 PA systems installed all over the place and 56 CCTV that were installed at all important location. These CCTV were used to monitor the crowd movement, control traffic and keeping general law and order situation at normal. The CCTV cameras were very advanced and they stored a total footage back-up for 12 days. Since the surveillance was done round the clock, there were 3 shifts of officials monitoring the footage.

Figure 8: Public Announcement System and CCTV Camera

There were, however certain issues that the officials were facing in terms of PA system. Since it was shared with the Lost and Found dept, there were discontinuities in services. Also, the PA system was not very effective and lacked clarity.

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh -2007	Kumbh-2013
1	Police Stations	No.	28	28	30
2	State Police Personnel	No.	9965	10913	12461
3	PAC	No.	35	45	46
4	Central Para Military Personnel	No.	7	40	40
5	CCTV Camera	No.	0	19	56
6	Variable Signage Board	No.	0	0	30
7	Fire Station	No.	28	28	30

Table 12: Police and Fire Services

iii. Fire Services

The government installed altogether 30 fire stations in all the sectors along with 30 police thanas and 24 watch towers. There were adequate motor fire engine according to the need and risks with water mist mounted on vehicles. There were altogether 21 fire officers, 8 Chief Fire Officer, 1 Dy. Dir, 16 second officer, 100 leading fire men, 101 drivers, 426 fire men and 47 motor fire engine.

The dept of fire had started the preparation way back in May 2012. The department dedicated a team and budget for awareness and publicity. They had one dedicated vehicle which they used for awareness generation and distribution of pamphlets. The whole effort was coordinated by IOCL, Electricity Department and Jal Nigam. The fire department also provided fire extinguishers in all the tents put up by the government. The dept was also equipped with floating jelly, drum lines and manned by Jal Police. They also had 4 ambulances which were equipped with wireless sets and they received 250 calls approximately for the period.

Figure 9: Bike mounted firefighting equipment

Figure 10: Firefighting Multi-utility vehicle

According to the Chief Fire Officer, response time is very crucial but at the same time it is quite challenging. And hence all the fire stations were planned by the side of 30 police posts spread over 14 sectors. This was however not very effective and hence the arrangement of the same would be changed in the next KumbhMela. Out of all the incidents ending up in fire outbreak, about 37% result from electricity and equal percentage originated due to LPG cylinder mishandling. Also, there were no control over the maximum number of people staying in one camp and hence there were substantial variation in settlement patter due to this.

iv.   Health and Sanitation

Dept of health had installed 20 bedded hospitals in all the sectors which had 5-6 doctors and 6-7 supporting staffs. There was a main centrally located hospital with 100 beds and manned by 70 doctors. Till the end of the Mela, almost 4 lakhs people were treated in the hospitals. The general health related complaints were limited to Asthma, Allergies, diabetes, old age related problems, blood pressure, minor accidents etc.

Figure 11: Main Hospital

Figure 12: Main Hospital Ward

For emergencies, there were 50 beds reserved in Allahabad Medical College. There were also stockpiling of blood products done in anticipation of any incident. The EMRI ambulance services were also put in place and its services were being coordinated from Lucknow.
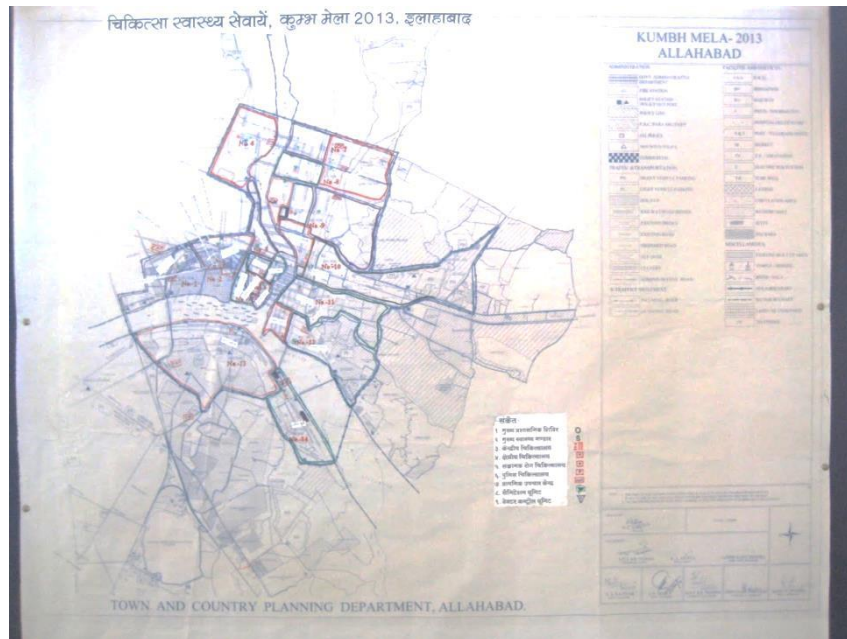

Figure 13: Fogging in one of the sectors

Figure 14: Maps displaying Medical Facilities in the Mela Area

Sl. No.	Service/ Infrastructure	Unit	Kumbh-2001	ArdhKumbh - 2007	Kumbh-2013
1	No of Allopathic hospitals	No.	14	14	14
2	No of Homeopathy hospitals	No.	07	07	12
3	No of Ayurvedic hospitals	No.	10	10	12
4	No of beds in mela areas	No.	360	360	370
5	No of Toilets	No.			
	• Individual		20481	17000	35000*
	• public toilets				
	• Sulabh Complex (10 Seaters)		20	105	340
	• Trench Pattern		17100	12875	7500 (PRAI TYPE)
	• Non-conventional Toilets		0	0	1000*

Table 13: Medical/Health/Hygiene facilities

In terms of sanitation, there were altogether 7000 sweepers across the sectors. The waste water disposal was coordinated by Jal Nigam. This time the department has introduced "zero discharge" toilets and there were around 630 movable toilets spread all over the sectors. The large numbers of toilets were installed to check the large population for open air defecation. There were regular uses of bleaching powder and fogging for control of pests. They coordinated with Nagar Nigam to execute all the solid waste management related works. Besides, each sector had health inspector who kept a close watch on health and sanitation related issues.

Figure 15: Zero Discharge Toilets

Figure 16: Mobile Toilets

v.   Safety and Security

The security at Kumbh Mela site was very tight. Besides the 30 police thana and 40 police posts, there were presence of 36 companies of CISF, 25 companies of PAC and 4500 Home Guards. The management had also put in place a Sniffer Dog Sqad, Bomb Sqad and an Anti-Stoppers team. Two additional Companies of PAS and 100 Civil Police were called from Uttarakhand. To keep the militancy under check, 150 commandos were placed all over the Mela area. Also, for the safety of the public, there was a presence of 200 boats, 50 motor boats and 180 divers.

The lost and found unit that was being managed by the NGOs were doing outstanding job of tracing lost people in the Mela and helping them meet their families or transporting them to their home free of charge in trains.

Figure 17: Boats for Patrolling

6. Gap Analysis

Despite a very planned and coordinated management of the Kumbh Mela, 2013, there were some shortfalls at many fronts. Some of them are detailed below.

Major Incidents

Whatever be the size of the population visiting the Mela, it is expected that there are zero deaths and no incidents that result in human life loss, property loss etc. But it was very unfortunate that a couple of such incidents happened during the Kumbh Mela at different places. Despite fool proof preparations, the Railways failed to prevent the stampede on 10th February, 2013. The stampede was clear outcome of inability of Railway management to contain an unexpectedly large crowd that was exiting the city after Mauni Amawasya. This resulted in death of 36 people.

In another incident, 5 people were charred to death and 19 others injured when a fire broke in one of the make-shift tents on 25th January, 2013.

Health and Sanitation:

Though the management claimed that there were adequate toilets and good solid waste management facilities, there were very high numbers of people going for open air defecation. Additionally, the solid waste management practices were not very satisfactory. There pollution level at Ganga Ghat was very high. The devotees offered garland, other materials for worshipping the Goddess Ganga, but the offerings remained in the water for fairly long period of time. The water was further polluted by the flow of untreated water inside the river.

Security and Safety

Though there were police and divers patrolling late evenings along the ghats, there were incidents of people bathing at unsafe places in the river.

Figure 18: Solid Waste

Information and Communication Technology

The ICT system was very complex and effective but the PA system did not work optimally. The voice quality was extremely poor and hence it was difficult to hear clear announcements. At the same time, the PA system was shared between the NGOs working on Lost and Found unit and Police Control Room. This created chaos and neither of the two entities could clearly communicate themselves. Also, for greater good, many more display units should have been installed at all the strategic places where the crowd was huge.

Electricity and Fire

The Electricity dept had introduced new technology of Guarding to prevent electrocution. But there were several incidents of breach of wire and the guarding did not work. There were few isolated incidents of short circuit but no major outbreak. One of the major shortfalls in the electrical safety was due to use of aluminum wires instead of copper wires and no presence of MCB anywhere. This highly compromised with the electric safety.

There were many fire incidents due to mishandling of LPG cylinders. The people did not take heed from the fire department and continued to handle it in an inappropriate way. There was also a need felt to keep the fire stations strategically located. Mere placement of the station along the police thana wouldn't be helpful. Once alternative that could be used next year would be placing the fire stations in hexagonal arrangements so as to maximize the reach. The incident of major fire looms just because there settlement patters is violated. If strict control is kept over the settlement patter according to the need and as per the plan, the spread of the fire could be contained.

General Observation

- Though the management claimed to have built spots for bathing of women, there were hardly any of such spots observed. Only changing rooms were made for ladies.
- The Police force was working restlessly day and night to keep the general law and order situation under control. But they were not adequately trained to handle the people in most polite way. If they were imparted training on behavioral skills, that could have benefitted everyone.
- There is no provision for the transportation of people with special needs. The motor vehicles were stopped 5 km away from the Mela area and due to this the people with disability find difficulty.
- The maps of Mela for amenities and route were not displayed. Also the police personal working in the Mela didn't know the well about the route. The co-ordination between the railway and roadways administration were also not established in a proper manner.

7. Recommendation

The findings at Kumbh Mela are of utmost significance and relevance to the events of similar nature in Bihar. The Chhath Pooja, Durga Pooja, Harihar Kshetra, Pitripaksha and Malmas Mela, Rajgir etc. attract crowd of similar nature and such events are threatened by similar hazards. The disasters occurring at such events can be minimized given the fact that the learning from Maha Kumbh is adopted. *Some of the recommendations based on Maha Kumbh Mela, 2013 are described below.*

i. **Hazard Identification**
- The foremost step of mass gathering event management planning is identification of hazards in the vicinity
- The hazards may vary from place to place but will include earthquake, floods, uncontrolled crowd, fire, bomb blast, public health hazards such as food poisoning, accident prone areas, etc.

ii. **Risk Assessment**

Based on the hazards identified, a proper risk assessment should be carried out based on demographic, environmental, and socio-political factors. The risk can be identified based on

- Event type, duration and location
- Time, day and season of the event
- Expected crowd numbers; age of crowd; mood of crowd
- Weather and local hazards
- Surveillance for public health & sanitation. (Fogging, hospital preparedness, solid waste management).

iii. **Awareness and Sensitization**
- Stress should be given on public awareness and sensitization.
- Adequate measures should be taken to ensure proper dissemination of Do's & Don'ts specific to hazards among the public through various Information, Education and Communication (IEC) materials. If possible, leaflets on the same should be widely distributed with all the information on emergency numbers and maps showing public amenities and emergency services locations.
- Clear information on safe exits and route maps should be displayed at important junctions

- Electronic display boards should be placed at busy locations along with PA system speakers.
- To prevent rumors, proper information on real time basis should be provided to public.
- These signboards should also be used as media to spread awareness on Do's & Don'ts', announcement on any emergency situation, lost and found, public amenities information etc.
- Blown up maps of the area displaying important places such as police stations, hospitals, open spaces etc. should be displayed on billboards.
- Emergency numbers (police, fire service, medical service, ambulance, NDRF etc.) should be displayed at all the locations.
- Also, information on public amenities, and helpline numbers should be regularly announced on PA system
- Adequate numbers of "May I Help You" counters should be set up at strategic locations such as entry and entry routes, airports, railway stations, bus stands, auto stands and event areas to answer basic queries of public
- One "Lost & Found" booth should be set up at strategic location in the area of event.

iv. Crowd Management

A mass of individuals/ people may have the following characteristics:

- Individuals attempt to move faster than normal.
- Interactions between individuals lead to formation of groups within the crowd.
- Exits become arched and clogged.
- Escape is slowed by fallen individuals serving as obstacles.
- Individuals display a tendency towards mass or copied behaviour.
- Alternative or less used exits are overlooked.

Crowd management may include

- Traffic control,
- Controlled access to restricted areas,
- Lost person reports, and
- Assistance for emergency service.

Provision of trained personnel to provide security and access to staff, authorized personnel and officials is recommended. Crowd management can best be achieved by;

- Training of security/volunteers in crowd control.
- Specific entrance and exit points clearly identified and displayed at site.
- Establishment of uni-directional flow of attendees/devotees.
- Avoidance of overcrowding with adequate filtering, limited entry and public address measures.
- Adherence to fire safety protocols.
- Emergency exits free from obstruction.
- Available fire and site evacuation plans.
- Crowd modelling based on space of movement, clear direction, available time and flow of crowd needs to be done.

The following strategies can also be adopted for efficient crowd management:

- Making traffic/crowd flow one way.
- Segregation of crowd based on vulnerable groups, VIPs, Media etc.
- All emergency services like fire fighters, security, police, NDRF, First-aiders will stationed near the venue to avoid any eventuality.
- Restricted vehicular movement within event area.
- Use of coaches and buses to reduce private vehicle usage and any potential problems which large vehicles may present, for example access difficulties, parking requirements, potential road blockages.

v. **Traffic Management**
- A proper display of direction and important information will reduce chaotic situations in such events.
- Vehicle movement needs to be closely monitored and regulated in the area of event.
- Restriction on vehicles in crowded area, their diversion to some other non-crowded routes and permission to ply only small non-polluting vehicles such as "Thela" and manual Rickshaw should be given
- Also, the following points need to be kept in mind for regulating traffic:
    1. Clear and visible signs and directions at important places
    2. Wide entry and exit routes

    3. Sufficient parking space

vi. Medical Aid and Hospital Preparedness

- Evaluate, plan and prioritize medical healthcare needs for the mass gathering including:
  - Planning for the number and location of on-site First Aid Posts and medical facilities.
  - Human resource planning, e.g. ambulance, paramedics, emergency physicians, nurses, first aid volunteers, safety/security officers
  - Planning for provision of medicines, beds etc.
  - Education and training of healthcare personnel/volunteers
  - Co-ordination with local hospitals and nearby districts for additional medical assistance.
  - Defining a chain of command and communication strategy (public and media).
- Establishing First Aid Posts at strategic locations within the event area
- The management of First Aid Posts should be done by doctors, paramedics, trained volunteers, district administration, and Red Cross
- Alert should be sent to hospitals of neighboring districts and towns for assistance during mass casualty.
- The administration should have the ambulance database handy.
- Allocation of certain number of beds in the government hospitals as well as the private ones should be done well in advance to address any emergency situation.
- A network of hospitals doctors and health care centers need to be developed who would work in the period of event
- Stock piling of different groups of blood and emergency medicines along with list of possible donors should be kept ready.

vii. Fire Services

- Temporary fire station should be set-up at strategic locations based on the flow of the crowd and the density of shops and other establishments.
- Bike mounted firefighting equipment should be installed at all the important locations to increase accessibility of areas where fire-tenders can't reach.
- There needs to be specialized and dedicated team ready to respond to any emergency. Prepositioning of the officers and staffs should be done for the entire period.

- Additional water pipes should be laid and water drums should be kept at regular intervals to meet the demands for firefighting.

- Fire extinguishers should be installed at the places where the congregation is within an enclosure/ temporary structure/religious places or halls.

- Banning or very limited usage of combustible materials should be done in the area. This should be properly monitored by the security personnel.

- Display of fireworks/ crackers should be allowed only in open spaces and away from gathering/densely populated areas.

- Wherever temporary structures are to be constructed, they should be done using "Fire Retardant Solution".

- Public should not be allowed to use incense sticks at a densely crowd area.

viii. **Temporary Structures/ illumination/ lighting**

- There can be temporary hazards such as damaged approach roads, bridges, pedestrian ways, subways etc.

- These temporary hazards can easily be removed by dressing of roads, repairing of bridges, proper tiling of pedestrian ways, repairing of other structures such as walls etc.

- In the events around any water bodies (such as Chhath Pooja, Durga Pooja, Harihar Kshetra Mela etc.), temporary bridges have to be constructed to ease out traffic on few identified paths. The bridges need to incorporate safety aspects in terms of strength, width, length etc.

- Since the public activity in such events continue even at late evening hours, the roads should be properly illuminated and the area should be lighted with adequate street lights. This will even help curbing anti-social activities.

ix. **Water supply**

- Safe drinking water is one the basic requirements and adequate measures should be taken to ensure its constant supply during the period of event.

- Water supply though tankers, temporary pipelines and regular underground pipelines should be made available to people

- Quality of drinking water should be a high priority. Waters tanks should be chlorinated.

- Temporary outlets/taps for drinking water and bathing should be provisioned separately to meet surge in demands.

x. Sanitation and Solid Waste Management

- Adequate numbers of garbage containers should be placed at all locations. The containers should be emptied frequently, at least twice a day, to maintain a clean and safe environment. The number of containers will depend on the size of the event, the population density, crowd movement and the amount of waste generated per day.

- The placement of these dustbins at strategic positions likes near the venue, near vending shops, market places etc. will help keeping the area clean

- The municipal corporation should ensure that there is availability of adequate sweepers and waste disposal units covering the entire area and sweeping is done every day before the crowd movement starts.

- Daily timely pick up and disposal of solid waste should be made.

- Waste disposal sites/ landfill sites should be identified well in advance and it should be out of the vicinity of the city.

- To prevent open air defecation, zero discharge toilets need to be constructed. Additionally, adequate number of mobile toilets should be arranged.

- The drainage system of the city/ event area should be properly inspected to unclog it so as to prepare the area for any unprecedented hydrological event such as flash flood or cloud bursts.

- Regular fogging, sprinkling of bleaching powder and other pest control measures should be taken to contain communicable/ non communicable diseases.

- A Health Inspector should be deputed in major areas to supervise the sanitation and solid waste management related activities.

- Regular and frequent cleaning of Ghats and areas around water bodies should be carried out.

- Filtering of pollutants and waste material from water bodies should be done regularly to prevent diseases and skin related ailments.

- Green initiatives such as banning of polythene bags during event period and use of paper bags, clothed carry bags etc. should be promoted.

xi. **Capacity Building of stakeholders/ volunteers**

- The city/ town where the event is being held should identify the volunteers group such as NCC, Red Cross volunteers, students from local schools and colleges with training these groups can be excellent resources for responding to any unforeseen events and they can be helping hands to police.

- The Police officials should be given basic refresher on disaster management and imparted training on behavioral skills as they would be interfacing very closely with general public.

xii. **Special Care for vulnerable groups**

- In general, elderly citizens, pregnant women and children form a very sensitive and vulnerable group of the society. Hence, they need special care and attention.

- Hand pulled rickshaw, thela, and battery operated vehicles etc. should is made available to such groups.

- Temporary/ permanent changing room for women near the Ghats should be provided for privacy and to reduce anti-social activities.

xiii. **Law and Order, Safety & Security**

- In planning and throughout all stages of the event, a close coordination and working relationship should be maintained amongst:
  - District administration;
  - Health and medical services;
  - Other Police and other emergency services (Fire fighters); and
  - Other security services, for example Civil Defense, Home Guard, NCC, Scouts & Guides.

- Police patrolling needs to be beefed up during the event with mobile vans and temporary check posts positioned strategically to contain anti-social activities such as chain snatching, eve-teasing, looting, vandalism etc.

- CCTV should be installed at important junctions, markets, bus stands, railway stations and event areas to have better monitoring mechanism. The CCTV system should be having sufficiently large back up periods (72 hrs or more).

- Watch towers can be constructed at important places for constant monitoring of the event area.

- These events are soft targets for terrorists. Hence to be ready for any unprecedented situation, Home Guards, NDRF along with bomb squad and sniffer dog squad should be stationed at strategic locations in the area.
- NDRF has a highly developed team of divers and motor boats. They should have their presence in and around the Ghats.

xiv. **Incident Command Centre (ICC)/ Control Room**

- To monitor, manage and make decisions, a dedicated center needs to be established.
- An Incident Command Center will also act as an Emergency Operation Center.
- It will house the CCTV display/monitoring units, the communication equipment such as satellite phones, fax, fixed line and mobile phones, computers, laptops, internet connectivity, video calling facility, power back-up, trained technical staffs and important decision makers (in proper shifts round the clock)
- ICC will also control the PA system and coordinate between the Lost and Found Booth and the security.

xv. **Electricity Supply:**

- The entire area should be divided into zones for electricity supply based on extent and duration of event.
- Adequate substations (based on load) and transformers need to be installed.
- There should be mobile transformers readily available to meet any sudden surge in demand.
- There should be no wiring very close to the water bodies. This will minimize chances of live wires falling into water thus increasing risk of electrocution.
- Electric guarding should be properly done so as to cut-off electricity supply in event of breach in wiring.
- Places where wires come in close vicinity of people, usage of PVC conduit pipes should be used.
- Use of MCB and copper wiring further reduces any chance of electrical overloads
- A proper planning of electricity supply and network of High Tension wires and Low Tension wires should be made so as to avoid heavy crisscrossing at major/ crowded junctions.

- The entire street light should be repaired and additional temporary street lights should be installed.
- Power back-up with provision of adequate generator should be done to avoid any blackout.

xvi.   **Use of Technologies**

The governments should start investing on technologies such as

- Geospatial technology for mapping of the space for better planning and quicker response,
- RFID (Radio Frequency Identification) to check movement of people,
- Good Public Addressing system,
- Enhanced Information Technology to visually monitor the space such as surveillance camera/CCTV etc.
- Cyber security team should be on high alert monitoring popular social media sites so as to prevent rumors and incorrect information to public.
- There should be ban imposed on improper announcement systems and keep a check on unnecessary replication of the same information. Inappropriate announcements add to rumors and create confusion.
- Information regarding the place, weather, traffic, route, public amenities etc. is made available to public on internet and through mobile apps.

xvii.   **Media Relations**
- The administration should plan a dedicated time and place for disseminating the information on regular basis from the field.
- The media personnel should be given strict instruction on type of information that needs to be disseminated.
- Regular briefing of media by administration should be made to help developing a better coordination between media personnel and administration.
- Media - print, voice or visual - is an organized means of reaching a large number of people, quickly, effectively and efficiently. The suggestive, informative and analytical role of the media must form a key component of disaster education, before a disaster, educating people about the hazard, prevention and self-help during the disaster. Media can play important role in the following areas:

- Early warning to the people
- In making appeal to the people
- In preventing rumors and panic management
- In controlling law and order situation
- As replacement of established communication network

xviii. **Involvement of local groups**

- Administration should identify clearly the roles and responsibilities of the local groups and issue clear instructions to them in discharging their part of duty in collaborative and accountable manner.
- The administration needs to ensure that there is no mushrooming of such local groups thus causing conflict, civil unrest and confusion.

xix. **Post Disaster Incidents Management**

- A comprehensive Disaster Response Plan should be ready with all the departments.
- Prepositioning of specialized teams such as that of NDRF, Civil Defense, Search & Rescue team, First Aid team, Logistics Management team etc. should be as a precautionary and preparedness measure.

xx. **Reverse Logistics/Exit Plan**

- As mentioned earlier, these events of mass gathering are temporary in nature. Hence, a clear exit plan and reverse logistics need to be included in the planning process. This is needed to bring the city or the locality back to state of normalcy.

xxi. **Documentation**

- A proper documentation of each and every aspect of event should be done right from the beginning/ planning phase extending up to the event execution and exit.
- Documentation is most helpful toolkit to learn from the past and implement the good practices evolved during the last event, and the need assessment for future events.

8. Conclusion

As one of the biggest congregations in the world, KumbhMela saw a massive 120 million people coming to attend it. With a population so large, it was a herculean task for the district administration to manage the event. Though the task was well managed by the administration, there were some isolated incidents of injury, life loss or any other incidents.

TheMela is acknowledged to be traditionally managed; however, this time the state government introduced modern technologies to manage the crowd. There were CCTV cameras, modern firefighting instruments, well equipped search and rescue team etc. The total effort was a planned one and hence most of the activities were executed seamlessly.

There was however some slack in the planning as the administration could not prevent the mishap at the railway station. Also, a more aggressive awareness generation campaign was needed so as to educate people of the personal safety measures.

Despite the shortfalls, one must appreciate that the government has done splendid work in managing this event of mass gathering and it has been able to handle a crowd of 120 million at a space as small as 60 square kilometers. Additionally, it has adopted some of the best practices that have captured attentions of many practitioners, governments, international research firms etc.

This case study undertaken by BSDMA aims to capture these best practices from Kumbh Mela. It may be useful for the government of Bihar in managing Chhath Pooja or similar events of Mass Gathering in a peaceful way with utmost safety and security.

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10.Annexures 1: IEC Material on Fire Safety

महाकुम्भ मेला – 2013 में आये हुये श्रद्धालुओं से अनुरोध है कि अग्नि (आग) से सुरक्षा के लिये निम्नलिखित बातों का ध्यान रखें :—

क्या करें

1. आग लगने पर "आग–आग" कहकर शोर मचावें। पडोस के समस्त सदस्यों को सचेत करें।

2. आग लगने पर क्षेत्र के फायर स्टेशन को तत्काल 1045 एवं 9454418358 पर सूचित करें। महाकुम्भ मेला में प्रत्येक क्षेत्र में फायर सर्विस की यूनिट 24 घण्टे निःशुल्क आपकी सेवा के लिए हमेशा तत्पर है।

3. फायर सर्विस पहुँचने तक आग बुझाने का हर सम्भव प्रयास करें।

4. आग की सूचना देते समय घबरावें नहीं बल्कि अपना सही पता, मुख्य मार्ग, अथवा कोई प्रसिद्धस्थान का जिक्र अवश्य करें। ताकि फायर यूनिट अविलम्ब घटना स्थल पर पहुँच सके।

5. आपके कपड़ों पर आग लगने पर भागिये नहीं बल्कि हो सके तो कम्बल लपेटें अथवा जमीन पर लोट–पोट लगायें।

6. कमरा टेन्ट, झोपड़ी छोड़ने से पूर्व अंगीठी या चूल्हे की आग को अच्छी तरह बुझा दें।

7. कैम्प में या टेन्ट में बिजली की वायरिंग को समय–समय पर चेक करते रहें। अगर कहीं से कटी–फटी हो तो फौरन टेप करा दें अथवा तार को बदल दें।

8. फायर ब्रिगेड की गाड़ी जब आये तो आने के लिये रास्ता दें ताकि घटनास्थल पर पहुँचने में विलम्ब न हो।

9. आग बुझाने में फायर ब्रिगेड की मदद करें।

10. आग लगने पर आस पास के टेन्टों व फूस की झोपड़ियों को उजाहकर हटा दें।

11. झोपड़ियों–टेन्टों में आग लगने पर उसे गिराकर बालू या पानी फेकें। आसपास की झोपड़ियों या छोलदारियों को गिरा दें तथा आग की बढ़ने से रोकें।

12. टेन्ट या झोपड़ियों में आग लगने पर तुरन्त छोड़ दें। सम्पत्ति या धन के लालच में जान न गवाँए।

13. जलते हुए चिराग, स्टोव, लालटेन, गैस बत्ती में तेल न डाले।

14. रेडियो, टेलीविजन, साइरन, व अन्य विधुत यंत्रों को प्रयोग के पश्चात बन्द (ऑफ) कर दें।

15. सिन्थेटिक, नॉयलोन आदि फाइबर के बने कपड़े पहनकर आग के नजदीक तथा हवन–कुण्ड, चूल्हा या अलाव के समीप न बैठें।

16. बीड़ी, सिगरेट, जली हुई माचिस के टुकड़े आदि पीने के पश्चात बुझाकर फेंक दें।

17. दीपक, मोमबत्ती या खुली जलती आग को लेकर इधर–उधर न ले जाएँ।

18. तेज हवा के समय खुले मैदान में खाना न पकायें।

19. इस संबन्ध में आपकी चेतना व सतर्कता ही मुख्य सुरक्षा है।

20. कुकिंग गैस सिलेण्डरों को प्रयोग से पहले भली प्रकार चेक कर लें।

21. प्रत्येक टेन्ट / पण्डाल में पानी को पर्याप्त मात्रा में रखें।

क्या न करें

1. बिस्तर पर लेटकर लापरवाही से बीड़ी सिगरेट आदि न पिये।

2. बीड़ी सिगरेट आदि जलाने के बाद माचिस की तीली को लापरवाही से इधर–उधर न फेंकें। फेंकने से पहले यह इत्मीनान कर ले कि तीली सही रूप से बुझ गयी या नहीं।

3. अंगीठी या चूल्हे को इत्मीनान से काफी पानी डालकर बुझा दें।

4. पेट्रोल, तेल, ग्रिद इत्यादि के पास बीड़ी–सिगरेट आदि न पिये।

5. बच्चों को दियासलाई की पहुँच से दूर रखें अर्थात उनको खेलने के लिए न दें।

6. स्टोव में भी पेट्रोल या अत्यधिक ज्वलनशील पदार्थ का प्रयोग न करें।

7. महिलाएं टेरीलीन, ठरीकाट जैसे अति ज्वलनशील वस्त्रो को पहनकर खाना आदि बनाने का काम न करें।

8. फायर ब्रिगेड के कार्य में हस्तक्षेप न करें, बल्कि वाँछित सहयोग दें।

9. पाइप लाइन एवं जल स्रोतों को क्षति न पहुँचायें।

10. कुकिंग गैस सिलेन्डरों को प्रयोग करने से पहले भली प्रकार जाँच करके प्रयोग करें। लीकेज वाले सिलिंडरों का प्रयोग न करें।

उत्तर प्रदेश अग्निशमन सेवा
उत्तर प्रदेश पुलिस

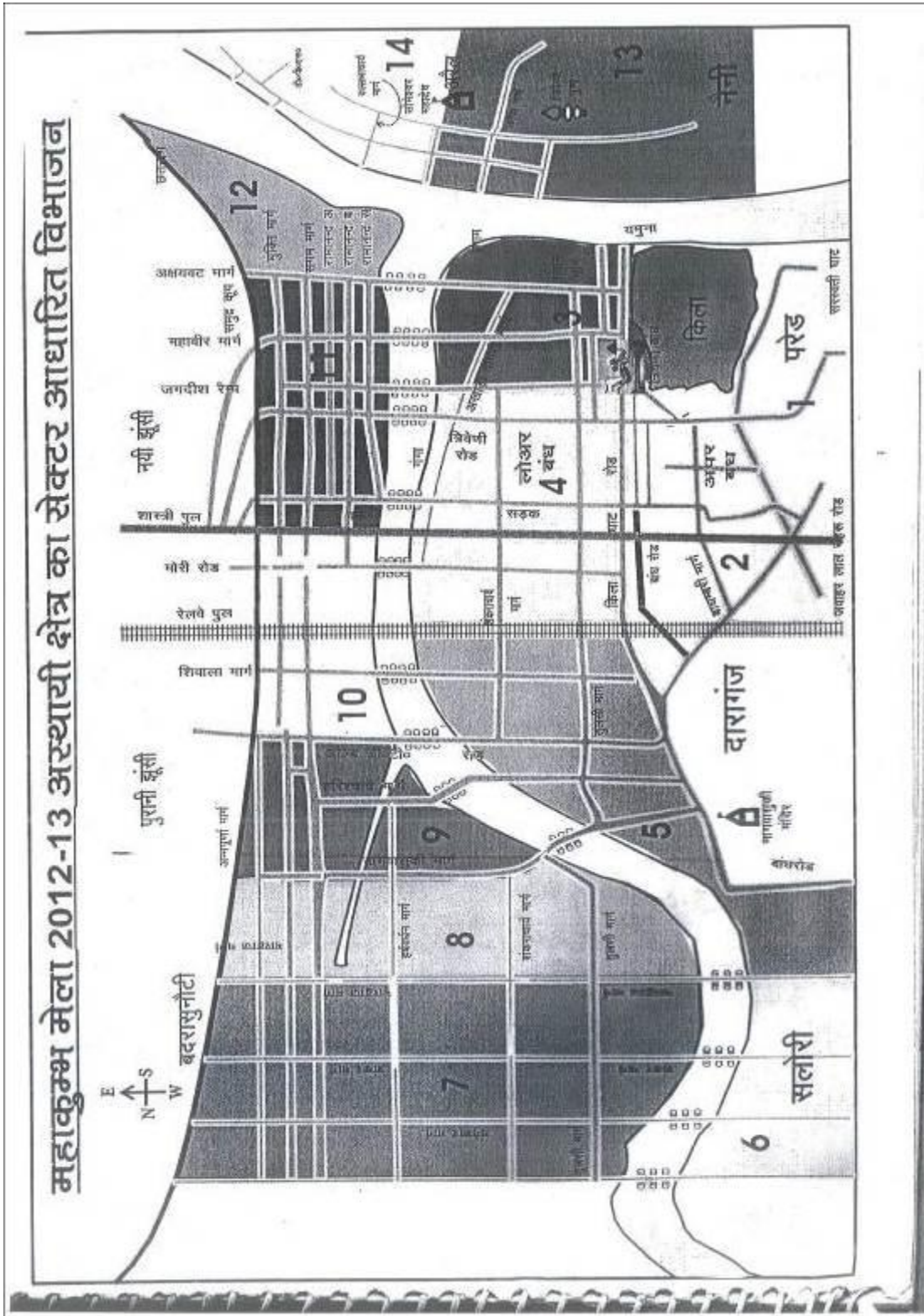## 11.Annexure II: Area Map of Kumbh Mela

12. Annexure III: Electric Supply Map
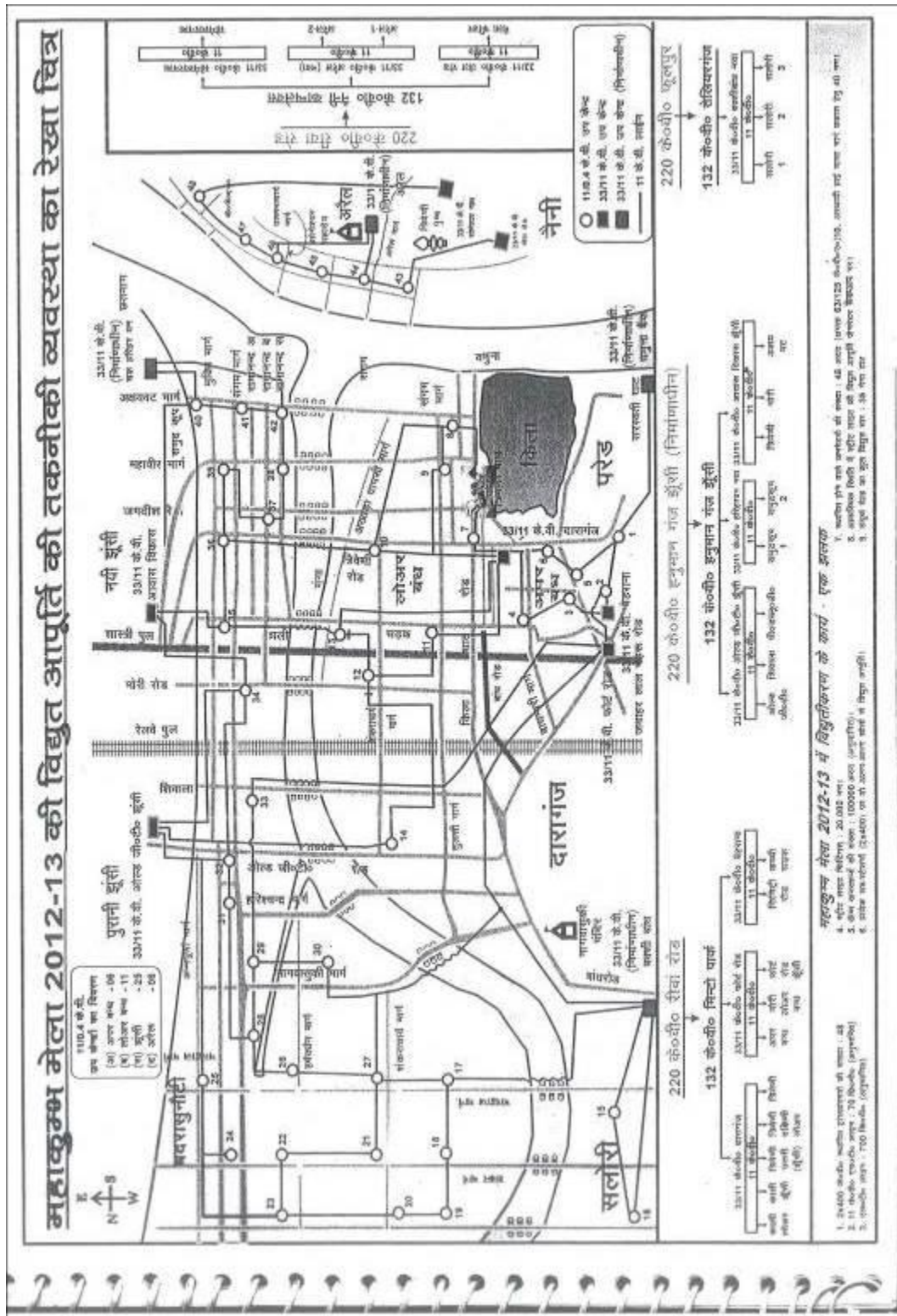
13.Annexure IV: Sector Division Map of the Mela Area

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