

Environmental Perspective and Its Implications To Policy Makers: A Case Study of World Famous Dhanuyatra an Open Air Roving Drama

Dr S.N. Panda¹, Dr.K.K.Pradhan², S.R.Mishra³

Principal, Department of Chemistry, Vikash Degree College, Bargarh, Odisha, India¹

Principal, Department of Management, Vikash School of Business Management, Bargarh, Odisha, India²

Assistant Teacher, Govt. Girl's High School, Bargarh, Odisha, India³

ABSTRACT: The present piece of presentation is also an attempt to make people aware of their role and responsibility towards sanitation during festive occasion through a case study of world famous mass gathering event DhanuYatra of Bargarh district presenting the civic sense of rural India. The present study, a case study of Dhanuyatra, aims at getting into the details of the operational planning for environmental aspect that goes into the preparation of such mega event. It also aims at outlining the good practices at the field level that could be adopted for any other festival. This study would examine good practices and gaps in overall management of the event and derive useful recommendations for organizing the event in an effective manner.

KEY WORDS: DhanuYatra, wastewater disposal requirements & solid waste management.

I. INTRODUCTION

Indian society is of many religions, faiths, festivals and events. Owing to its composition, there are mass gathering events being organized at various levels involving large number of people. In such situations how environment is getting affected in terms of certain vital parameter is a real concern for the civil society. Many research groups are working at grassroots level to find out the right mechanism to minimize the impact of polluting agents as a result of large gathering and its management in an unorganized way.¹ Indian society is experiencing a change in its mind set with the visionary approach of our Prime Minister Mr Narendra Modi to the basic issue of sanitation through his Swatch Bharat Abhiyan . Indian mass is gradually getting involved to the idea of cleanliness after a long gap of Gandhian period.

Mahatma Gandhi: "Sanitation is more important than political freedom"

II. PROBLEM STATEMENT

Dhanuyatra with large number of turnouts, within a short span of time in a very limited space with limited resources creates a lot of pressure to nature in this locality. With almost 15 lac people gathering² in an area of less than 15 square kilometers, it becomes difficult for the organizers to take care of the needs of every single citizen. This is similar to establishing and running a whole new city for a short period with all amenities.

III. SCOPE OF THE STUDY

The present piece of presentation is also an attempt to make people aware of their role and responsibility towards sanitation during festive occasion through a case study of world famous mass gathering event DhanuYatra of Bargarh district presenting the civic sense of rural India. The present study, a case study of Dhanuyatra, aims at getting into the

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

details of the operational planning for environmental aspect that goes into the preparation of such mega event. It also aims at outlining the good practices at the field level that could be adopted for any other festival. This study would examine good practices and gaps in overall management of the event and derive useful recommendations for organizing the event in an effective manner. Detailed study of such an event 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.

IV. PROFILE OF BARGARH DISTRICT

Bargarh is located in Western Odisha, close to the border of neighboring state of Chhattisgarh. It is positioned at 21.33°N 83.62°E with an average elevation of 171 meter (561 feet). The whole of Bargarh district lies in the Deccan plateau with Eastern Ghats running close to the town. As per the earthquake zoning of India, Bargarh falls in the zone 2 category, the least earthquake prone zone³. The headquarter of Bargarh district lies on the National Highway No.6, Kolkata to Mumbai, hence well connected to the rest of the country with well-constructed road. The Railway Station (Code - BRGA) is just 4 km off the main town. The nearest Airport is at Raipur (CG) (220 km) & Bhubaneswar (OD)(350 km). The best period of the year to visit this place is in between October to March as during this period the Dhanu Yatra Festival (reportedly World’s largest open air theatre) is observed here⁴. Though Majority of people are Odia in the town and peripheral region, still it is having a significant presence of Marwari , Gujrati , Muslim , Telugu community who have migrated and settled down. Within the Odia speaking population, the major communities are Kuiltas, Dumals, Agharias, Bhulias/Mehers, Brahmins, Teli etc. Kuiltas and Dumals are presumed to be an offshoot of the original Chasa(agrarian) community and is synonymous with the Khandayats of the coastal region. This is evident by the striking similarity of rituals and the gods they pray. Bhulias were migrated to and settled in this region by some rulers, but the exact time period is controversial. Agharias were migrated from the Mughal Empire of Agra for establishing a cultivator community during war when Kuiltas were assigned the duty of part-time Kshatriyas. Odia is the language for communication, official purposes and for education. A comparative statistics⁵ of demographic profile of the district in 2001 and 2011 is presented in Table 1 to find correlation of literacy rate with awareness activities. The total population and its density can provide an empirical assessment of impact of Dhanuyatra crowd on the basic amenities. Table-2 presents the rural and urban division of the demographic profile which is quite useful to study the social character of the festival as the crowd composition empirically indicate that behavior of youth is the prime factor⁶.

(TABLE-1)
Comparative demographic statistics of Baragrh district

Description	2011	2001
Actual Population	1,481,255	1,346,336
Male	749,161	681,500
Female	732,094	664,836
Population Growth	10.02%	11.53%
Area Sq. Km	5,837	5,837
Density/km ²	254	231
Proportion to Orissa Population	3.53%	3.66%
Sex Ratio (Per 1000)	977	976
Child Sex Ratio (0-6 Age)	957	957
Average Literacy	74.62	63.99
Male Literacy	83.68	77.41
Female Literacy	65.38	50.26
Total Child Population (0-6 Age)	162,922	174,490
Male Population (0-6 Age)	83,267	89,156
Female Population (0-6 Age)	79,655	85,334
Literates	983,783	749,820
Male Literates	557,217	458,534

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

Female Literates	426,566	291,286
Child Proportion (0-6 Age)	11.00%	12.96%
Boys Proportion (0-6 Age)	11.11%	13.08%
Girls Proportion (0-6 Age)	10.88%	12.84%

As per 2011 census, Bargarh had population of 1,481,255 as compared to 1,346,336 of 2001 census. The provisional data released by census India 2011, shows that density of Bargarh district for 2011 is 254 people per sq. km., where as the density was at 231 people per sq. km in 2001. The regular density is one of the most important aspect for the analysis of environmental scenario during festival.

(TABLE-2)

Comparative study demographic urban and rural divide of Bargarh district

Description	Rural	Urban
Population (%)	89.87%	10.13%
Total Population	1,331,145	150,110
Male Population	672,603	76,558
Female Population	658,542	73,552
Sex Ratio	979	961
Child Sex Ratio (0-6)	959	938
Child Population (0-6)	146,333	16,589
Male Child(0-6)	74,709	8,558
Female Child(0-6)	71,624	8,031
Child Percentage (0-6)	10.99%	11.05%
Male Child Percentage	11.11%	11.18%
Female Child Percentage	10.88%	10.92%
Literates	869,172	114,611
Male Literates	494,987	62,230
Female Literates	374,185	52,381
Average Literacy	73.36%	85.84%
Male Literacy	82.79%	91.51%
Female Literacy	63.75%	79.95%

The dominance of rural population (89.87 %) in the Bargarh district as compared to urban population is a noteworthy as it is a strong determinant of social character and life style of the locality. The average literacy rate is above 70% in both rural and urban area which is a bright aspect for socio-cultural growth. The interesting aspect is the percentage of male child and female child which present the progressive mind set of the people.

V. GLIMPSE OF DHANUYATRA

Dhanuyatra is a socio- religious festival having the rare distinction of an open air roving drama with no ceiling on dimension of stage, number of characters and also script. Some devotees of Lord Krishna started the first "Divya Mahotsava Dhanuyatra" in 1870 Shakabda Pousa Sukla Pratipada Sombar (Monday) dated 12.01.1948 at 12:00 noon and ended on Pousa Purnami Sombar (Monday) dated 26.01.1948 at 9:00 am⁷. The complete Bargarh town and its peripheral area is taken for as a kingdom of the mythological age (Popularly referred to as Mathura and Gopapur) as described in the different literature with central character Lord Krishna, where he demolished his own uncle and the symbol of evil forces King Kansa⁸. People from across the country gather over a period of 11 days in the Bargarh town. Many of them stay in a relatively smaller temporary settlement of around 15 square kilometers. The plethora of arrangement made by the administration, the civil society and the people themselves calls for immense planning, perseverance and dedication. The complete demographic profile of the district confirms the blending of modernity and

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

traditionalism in the character of the festival. The domination of rural population in the district also influences the social and environmental character of the festival.

Dhanuyatra and strategic locations for action: For this occasion the town of Bargarh becomes the city of Mathura, the river Jeera becomes the river Yamuna and Ambapali situated on the other side of Jeera becomes Gopapura. For eleven days the whole of Bargarh town is transformed into a very big stage even though the story of Kansa, his death and the exploits of Sri Krishna are enacted in 14 main places at Mathura and 4 main places in Gopa⁹. That is why the planning, to minimize pollution should be based on identification of locality for creating adequate facilities. For the same the festival can be divided into two components as per the activities i.e. Action of Mythological Drama and Action of entertainment and trade.

Locality of different action of Mythological drama : The festival is having two components based on two central character i.e. Kansa and Krishna . The complete range of activities of Kansa is confined to different parts of Bargarh town on different days .In the evening Kansa has to attend Darbar for Administrative work and also Rangamahar for entertainment. on two different stages. Rangamahar located at Nishamani High School field, is the centre of attraction because of variety of cultural presentations. This zone is a spacious one and is having 2-3 exits –entry option. There is a scope for the organizer to plan for solid waste management and also toilet facility which can curb the contribution of the festival to various kinds of Pollution. The real challenge for the organizer is at Hatpada where the Maharaja performs his regular RajDarbar in presence of heads of different departments of District Administration, people from political establishment, celebrities from different walk of life. Being the core activity zone from spiritual, cultural and social view point the space around Darbar always seems to be less as compared to rush .The central area is well connected to all parts of the town through various road . The crowd density is very high as compared to any other parts of the festival area. Thus crowd management as well as pollution control is always a tough task. On the other hand the action of Lord Krishna is located both at Ambapali and Bargarh . For childhood activities Lord Krishna stays at Gopapur (Ambapali) a locality with rural touch with sufficient space for people . So planning in that locality for basic amenities is little bit easier. It is connected to Bargarh through an abandoned bridge over river Jira so almost attention should be given to keep the river water pollution free. This time a small mina baazar is proposed to ease out pressure from the main arena. Apart from that it is also accessible through state highway towards Barpali having water sources beside the road. A circus in an open field can also attract crowd on the way. So the magnitude of arrangement should be enhanced to meet the growing challenges. The range of activities shifts to Bargarh (Mathura) after 7th day. He also moves around the Bargarh town but one of his most attractive activities NabKeli is at ManaBandha (pond) for 6 hours . The sanitation status of the locality is not that much hygienic as such owing to nature of habitat around. A careful planning is required for that zone as the water of the pond is mostly used by the people.

Locality of different action of entertainment and trade: Apart from the action of mythological play the entertainment and trade based activities are the important factors for crowd localization. Though it is difficult to specify the activity zone in totality , still major localities can be identified for arrangement .There is no clear and exact magnitude of crowd which makes the planning a more difficult task. The George High school field is the centre of most of the activities of this sort. This is close to National Highway and at the same time approachable from different parts of the town. Mina baazar with more than 100 stalls, Trade fair with around 50 stalls, Pallishree mela with around 50 stalls apart from other awareness activities and large number of food stalls attract the largest number of people to this field from 3.30 pm to 10.30 pm. To add to the rush there is an Auto expo arena in front of the school beside the connecting road from field to Kansa Darbar at Hatpada. The same road is also the link road to RangaMahal and Main Market place. The human waste based pollution and solid waste based pollution will be of severe magnitude due the unorganized crowd with their composite approach of Marketing and enjoyment. The concentration of suspended particulate in air can be viewed in naked eye over the ground. Noise pollution is also a major concern. Mini stadium close to RangaMahal is another zone for trading activities with National Handloom exhibition. In this venue the population density in peak hour is also not an alarming one and the locality can be managed with sufficient arrangement for basic amenities. The rest part of Bargarh town needs extra arrangement as compared to regular one because the nature of the festival promotes dynamic crowd rather than static crowd. The major contributors to air pollution are dust and exhaust from vehicles, generators etc. There is a sharp increase in the number of vehicles due to the need of the festival and the culture of group trip to the festival from different places.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

VI. EXISTING PRACTICES

The local administration^{7, 9} has already initiated large number of measures to ensure a festival with its best possible atmosphere in all respects. Those good practices are cited here for the reference of other organizers of different festivals.

1. The District administration under the able leadership of District collector initiated a polythene free Bargarh with the help of Merchant association. This programme may develop a new social behavior during Dhanuyatra to ensure a clean Bargarh in post Dhanuyatra scenario. There were occasions when these entire polymer based waste used to be collected and recycled in the local cement industry.
2. The Municipality authority is introducing the portable toilet system to manage the human excreta. They are arranging 20 toilets with 4 squad for waste disposal. They are arranging permanent urinals on strategic locations.
3. They are also putting a lot of effort to upgrade the street lighting system so that unorganized open toilet and latrine system will not be there during the festival.
4. Regular watering of the roads and ground area is helpful in minimizing the pollution level due to dust.
5. Already a plantation drive was organized by the Municipal authority to make Bargarh town clean and green .
6. Police administration and many other organizations are also arranging Swatch Bharat Abhiyan regularly for a Clean Bargarh.

VII. FINDINGS & SPECIFIC PROPOSALS

Despite all the efforts made by the administration, in time to come they need to move ahead with the help of latest technology and pollution management approach. This study is trying to put proposals based on certain specialized measures in two major areas i.e. solid waste and waste water.

Solid Waste Management.: The solid waste material is the part which has lost its utility and value to the first user or consumer, and is now a growing problem at global, regional and local levels. Improper disposal of solid waste pollutes all the vital components of the living environment such as air, land and water. India is famous for its festivities and has more occasions of solid waste generation than in other countries. Solid wastes during Dhanuyatra are of mixed composition¹⁰. The total amount of solid waste may contain biodegradable waste, non biodegradable and miscellaneous waste with different proportion depending upon the activities on that site. The waste materials are produced by various activities like eating, purchasing, human excrete, religious activities etc. Neither exact nor approximate quantification of solid waste is recorded yet . The management of solid waste at generation, storage, collection, transfer and transport, processing and disposal stage in an environmentally hygienic manner in accordance with the best principles of public health, economics, engineering, conservation, aesthetic and environmental considerations is the need of the time. Thus solid waste management includes all administrative, financial, legal, planning and engineering functions. At the initial stage at least the following mechanism should be developed to tackle the solid waste problem. There should be a solid waste hauler approved by health officer who will operate as per the specific guidelines.

1. Strategic location should be identified to place sufficient number of covered waste containers for effective accumulation of the solid waste generated at the gathering.
2. It has to be ensured that the waste containers are emptied as often as necessary to prevent overflowing, littering, or insect or rodent infestation.
3. It has to be ensured that solid waste and litter are cleaned from the containers periodically during the gathering and that, within 24 hours following the gathering, the containers are free of solid waste and are clean.
4. A team of health officers should be entrusted with demographic allotment to visit the strategic location to get themselves satisfied of the proper functioning of the mechanism.
5. Local volunteers or NGOs should be involved in the functioning and monitoring of the system.
6. On a case by case basis, the team of health officers may allow for more than 24 hours to clean up the site.
7. All solid waste should be collected and disposed as per the norms.

Wastewater Disposal Requirements.: M.R.Mahananda et.al¹¹ in their work PHYSICO-CHEMICAL ANALYSIS OF SURFACE AND GROUND WATER OF BARGARH DISTRICT, ORISSA, INDIA has already assessed that the

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

maximum parameters were not at the level of pollution except few parameters like nitrate for ground water. So ground water satisfies the requirement for the use in various purposes. Now it is important to manage the wastewater at normal time as well as festival time to prevent contamination of the water sources. Thus the following processes are suggested during Dhanuyatra .

- (1) All wastewater should be discharged to a public wastewater treatment system.
- (2) Where a public sewer is not available or not practical for connection, wastewater should be discharged into a wastewater treatment system approved in accordance with State and local wastewater rules.
- (3) Portable restroom facilities and wastewater holding tanks should be arranged.
- (4) The number of toilets and facilities shall be provided in proper proportion.
- (5) If consumption of alcoholic beverages are noticed in the township, there should be an increase in the number of required toilets by 40%.
- (6) There should be a minimum of one toilet that is accessible to handicapped persons and at a rate of 5% of total toilets.
- (7) Toilet facilities for men and women located in the same region and adjacent to each other shall be separated by an opaque, sound resistant wall. Direct line of sight from outside a toilet facility to the toilets and urinals shall be effectively obstructed.
- (8) The portable toilets to be located at a minimum of 100 feet from any food service operation and not far away from the activity zone of spectators or from other areas of activity which pertain to the gathering, as outlined by the authority.
- (9) There should be working hand wash stations at a minimum rate of one per 10 portable toilets or portion thereof. It may not be feasible to provide soap, water and single use towels at each hand wash station. Those items can be made available with nominal payment close to the station.
- (10) There should be a minimum of one covered trash container for every 10 portable toilets or portion thereof.
- (11) All portable toilets should be of sound construction (such as non-absorbent polyethylene), easily cleanable, and durable.
- (12) The tank capacity of each portable toilet shall not be less than 60 gallons. Chemicals used for sanitizing agents in portable toilets must be acceptable for use by the treatment facility accepting the sewage.
- (13) Each portable toilet must be secured against vandalism and adverse weather conditions by tie downs, anchors or similar effective means.
- (14) There should be a liquid waste hauler satisfying the local health department requirements.
- (15) All wastewater to be removed from each portable toilet at least once every 24 hours. On a case by case basis, the health officer may change this frequency.
- (16) Each portable toilet must be serviced and sanitized at time intervals that will maintain sanitary conditions of each toilet.

The installation of number of portable toilet naturally depends on crowd localization. As this festival is many localization centers with varying magnitude of crowd density along with varying purpose we put forward a proposal (Table 3) for the calculation of number of toilet. In that calculation crowd density and average time of gathering has been taken into consideration¹².

TABLE-3

AVERAGE TIME AT GATHERING (HOURS)										
PEAK CROWD	1	2	3	4	5	6	7	8	9	10
1000	4	6	8	8	9	9	11	12	13	13
5000	12	15	20	25	31	38	44	50	56	63
10000	15	25	38	50	63	75	88	100	113	125
15000	20	38	56	75	94	113	131	150	169	188
20000	25	50	75	100	125	150	175	200	225	250
30000	46	82	119	156	192	229	266	302	339	376

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 2, February 2015

40000	61	109	158	207	256	305	354	403	452	501
50000	76	137	198	259	320	381	442	453	508	563
60000	91	164	237	311	384	457	531	604	677	751

VII. CONCLUSION

The healthy average literacy rate (Table 1&2) provides the scope to make people aware of some standard environmental practices during a festival of such magnitude¹³ Festivals of Odisha can be regarded as the most important physical aspect of cultural tourism. Dhanuyatra is already identified as a tourist attraction festival by the Department of tourism , Government of Odisha as cited by Rajib Bhaduri¹⁴; in his work Heritage Tourism And Events In Odisha- A Qualitative Study Of Architectural Splendor Of Heritage Sites To Promote Tourism. So it is the responsibility of all the stakeholders of the festival to ensure an environment for a clean festival.

REFERENCES

1. Amit Prakash , Mass Gathering Event Management: A Case Study of MahaKumbh 2013, Allahabad , State Disaster Management Authority on Nov 26, 2013
2. Melina, Remy, "How Is Crowd Size Estimated?". Life'sLittleMysteries.com. (September 3, 2010).
3. www.ordistricts.nic.in
4. En.wikipedia.org/wiki/Bargarh
5. www.census2011.co.in
6. Frank J. Elgara, Christine Arlett , Renee Grovesb “Stress, coping, and behavioural problems among rural and urban adolescents”, Journal of Adolescence, 26 (2003),p 574–585
7. www.bargarhdhanuyatra.nic.in
8. Prabhukalayan Mohapatra, World's Biggest Open-Air-Theatre, Dhanuyatra of Bargarh, Orissa.gov.in/ Orissa Review * December - 2005
9. www.navratnaneews.com
10. Sudhanshu Kaushik¹ and Prof. Dr. Bishambhar Datt Joshi² ,“A Comparative Study of Solid Waste Generation at Mansa Devi and Chandi Devi Temples in the Shiwalik Foothills”, Kumbh Mela 2010 , Green Pages , April 2011
11. Mahananda & et.al. Physico-chemical Analysis of Ground & Surface Water IJRRAS 2 (3) March 2010
12. UTAH ADMINISTRATIVE CODE Rule R392-400. Temporary Mass Gatherings Sanitation(Subsection 63G-3-102(5)
13. www.unesco.org/education/GMR2006/full/chapt5 p-140
14. Rajib Bhaduri*; G. Anjaneya Swamy** Heritage Tourism And Events In Odisha- A Qualitative Study Of Architectural Splendor Of Heritage Sites To Promote Tourism IRJC International Journal of Social Science & Interdisciplinary Research Vol.1 Issue 11, November 2012, ISSN 2277 3630 92