

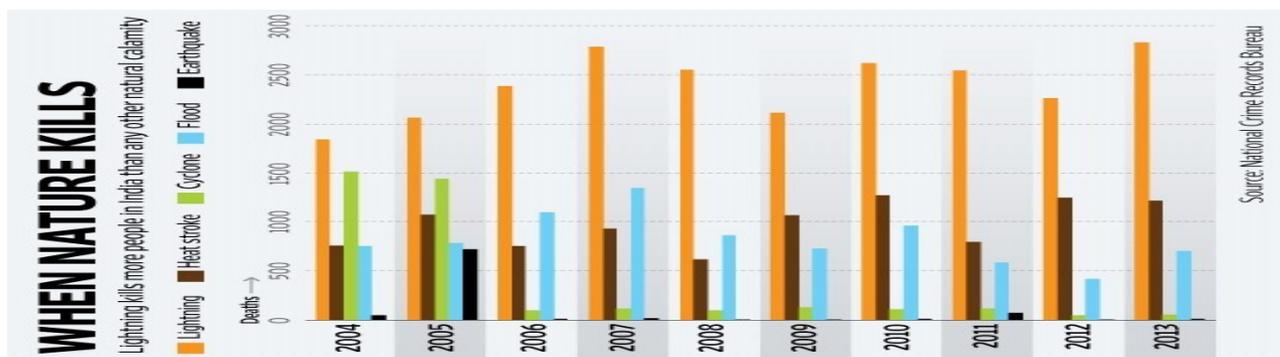
TRIBALS & MARGINALISED MOST VULNERABLE TO LIGHTNING - LIGHTNING RESILIENT INDIA CAMPAIGN 2019-2021

By

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Lightning Resilient India Campaign has decided to change its campaign more towards rural India . The impact and awareness of the campaign has been well felt and the fatalities in Urban areas have gone down considerably . However, the rural India seems to steadily recording increase in deaths . There are large number of high tech forecast, mobile app based alerts , Audio visual advertisements are there both social, electronic and print media but its outreach to rural community is found wanting . Climate Resilient observing systems Promotion Council (CROPC) – IMD – World Vision India have decided to have a paradigm shift in their approach towards lightning safety . The team is aggressively undertaking the campaign to the the specific segment of rural india that is to farmers, ladies, school children and communities in jungles and fisheries . A special focused plan has been chalked out to address the tibals and marginalised who have been found to be the frequent victim to lightning and other climate extremities.

Lightning kills more people in India than any other natural disasters. Annually more than 2500 people die due to lightning as per the report released by National Crime Records Bureau. It is pertinent to mention that the frequency of lightning is on rise due to rise in climate extremities like global warming, deforestation, environmental degradation, sudden change in weather leading to cloudburst, thunderstorms frequent cyclonic storms etc. as is evident from the death toll of 2018 which was more than 3000. Lightning fatalities are also accompanied by loss of livestock, livelihood and property.



Source : National Crime Record Bureau Report 2015

Figure 1: Lightning deaths from 2004 to 2015 along with other disasters fatalities

The deaths as noted by National Disaster Management Authority NDMA for period from 2016 to 2018 shows the rising trend in lightning deaths .As per NDMA, reported no of deaths year wise is 2016 – 1489, 2017 -2067 and as per media / unconfirmed reports it was more than 3000 in year 2018 .The trend of rise in Lightning death continues .

As per the information compiled by Lightning Resilient India Campaign , the lightning deaths from 01 April 2019 to 14 June 2019 , as per inputs available has reached 487 and the monsoon is just setting in. Please see the table below(data source media/ few state govts) :-

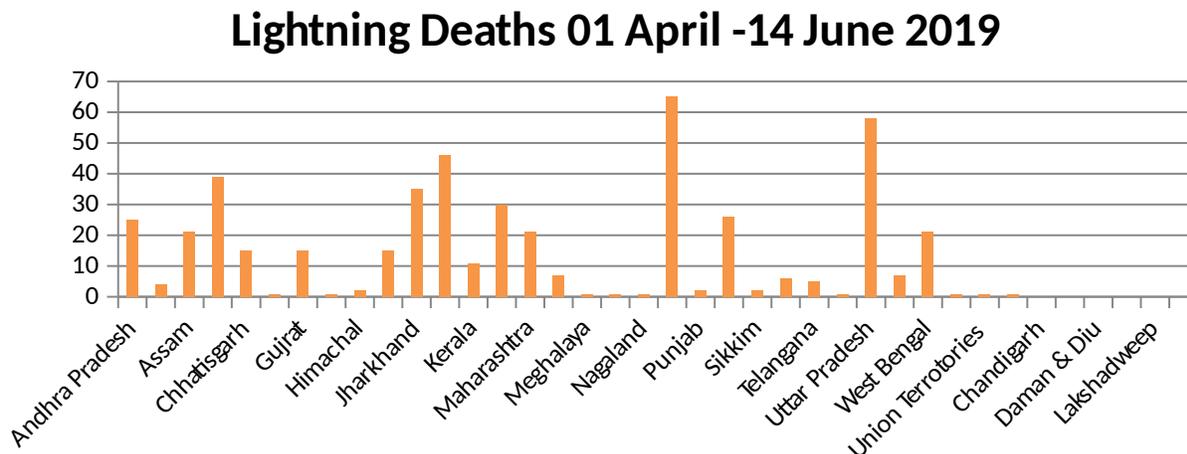


Figure 2: Lightning deaths from 01 April 2019 to 14 June 2019

However, Lightning is not yet notified by Government of India and many state Governments as a disaster. To generate an awareness and reduce the deaths due to lightning , Lightning Resilient India campaign has been launched on 26 March 2019 from IIT Delhi by Climate Resilient Observing System Promotion Council (CROPC) , World Vision India , Indian Metrological Department (IMD) Ministry of Earth Science , IIT Delhi and supported by National Disaster Management Authority(NDMA), Indian Red Cross Society (IRCS) ,UNICEF , All India Radio(AIR) and various government , non Government and civil society organisations . The aim of campaign is to reduce the deaths due to lightning by 80% in next

three years. The strategy adopted is create a network of volunteers from National to state and below level , identify disaster hotspot and address it comprehensively by **(i) carrying the Early Warning of lightning forecast of IMD to community in local language (ii) Creating awareness towards lightning safety through aggressive campaigning , education , training and Dos & Donts and (iii) Create Lightning Safe Infrastructure** . The concept Note of the Campaign is attached for reference

2. Post launch of the campaign on 26 March 2019 , CROPC in association with World Vision India, IMD, IRCS and other supporting agencies has been doing statewide consultations and trying to operationalize lightning Action Plan before the onset of monsoon 2019 . Lightning is like a diabetes and in a diverse country like India everyday few lightning deaths keep on taking place in one or the other state and hence its hardly noticeable as compared to deaths due to other disasters like Cyclone, Flood ,earthquake. However, if you sum up the deaths , there are cities like Mayurbhanj, East Singhbhum , 24 pargana South where annually more than 60 people die per year due to lightning . A large number of deaths go unreported too .It's a matter of very high concern that the deaths due to lightning is increasing day by day . In 2018 it was estimated to be more than than 3000 and in the ongoing your 2019 , as the monsoon is setting in , the death toll from 1st April till 15 June is more than 487 out of which 462 deaths(95%) were in rural area followed by 25 deaths(5%) in urban areas or semi urban areas which has inherent protection .

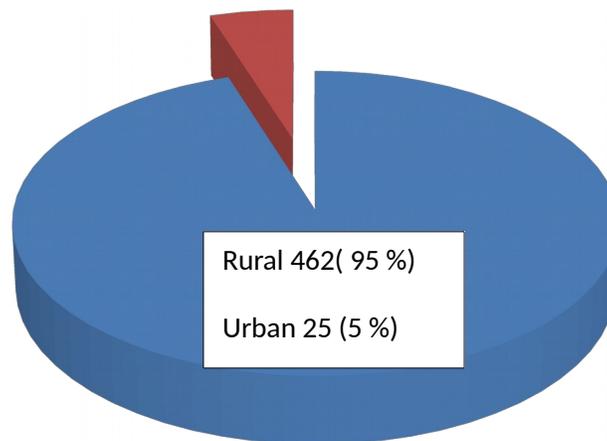


Figure 3: Rural vs Urban ratio of lightning deaths in 2019

The biggest challenge in the entire campaign is collection of data and collection of death records from the state authorities. Lightning Resilient India campaign has highest level of commitment from Indian Meteorological Department (IMD), CROPC , World Vision India ,

Indian Red Cross Society, Indian Meteorologist Society (IMS) , NDMA , UNICEF and Academia which includes large number of academicians, scientists and bureaucrats .

The collective team of Lightning Resilient India Campaign has observed that as per the current trend the death in rural areas have increased from 95% to 97% .On comparing the same gender wise , the death of male is almost 64% followed by females 36% .

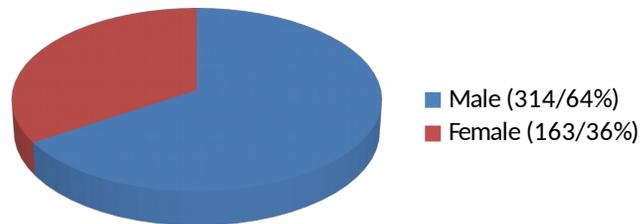


Figure 4 : Male vs Female ratio of lightning deaths in 2019

There has been a significant increase noticed in death of women and children both which is gone up from previous 20-25% to 35%. Profession wise , 314 deaths are of farmers which is 65% of the total deaths .

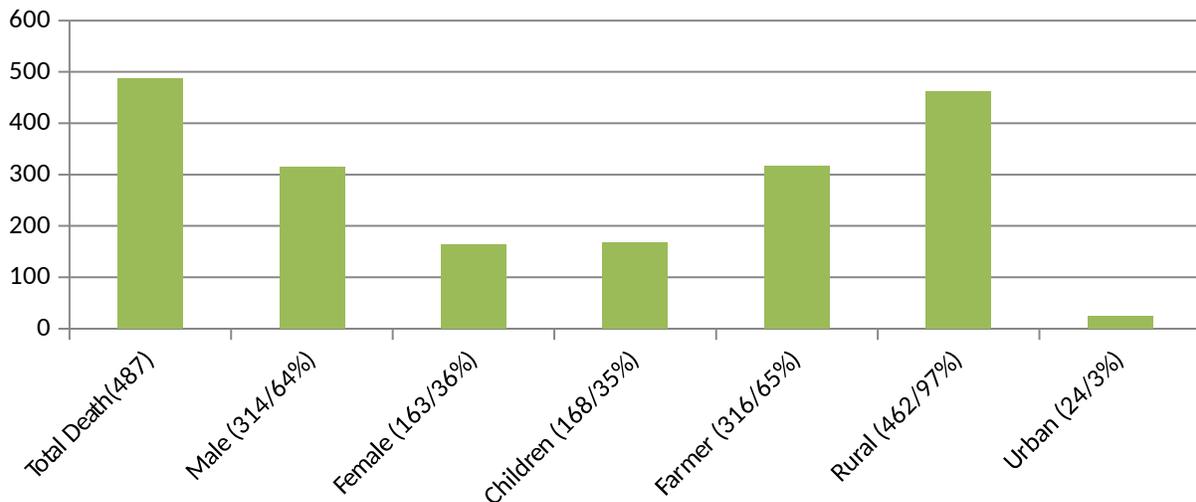


Figure 5 : lightning deaths in 2019- category wise distribution

3. The Expert Team of Lightning Resilient India Campaign carried out deeper analysis of the circumstances leading to death and observed that the primary cause of death is mainly due to people standing under tree which is 321 that is 66% of the total death 487

during last two and half months. The death due to direct hit being in open area / under katcha shelter was 107 (22%) and indirect hit / lateral strikes was 60 (12%) out of total 487 deaths .

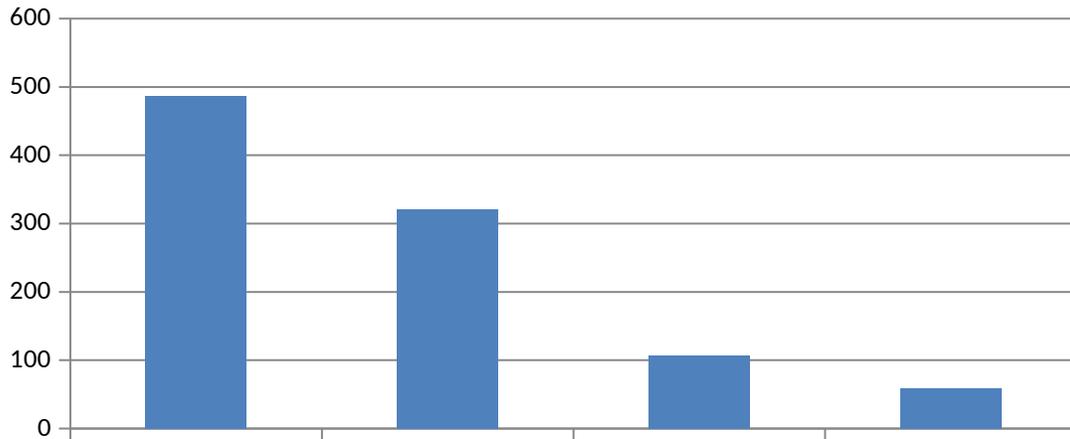


Figure 6: Primary cause of lightning deaths in 2019



Lightning Resilient India advocates not to stand under tree during lightning and thunderstorms

4. The Lightning intensity and frequency, both have shown a sharp increase in coastal areas as well as hilly areas, A new trend has come up is the huge lightning strikes in the river basin causing massive damage per strike. The recent lightning deaths in April- May 2019 along Ganges basin in Bihar, Yamuna & Chambal river basin in Uttar Pradesh, Narmada river basin in Madhya Pradesh are testimony to it. The Lightning Thunderstorm map of India from IMD for the survey conducted for the period from 1979 to 2010 clearly shows the trends. Its interesting to compare the same with the wind hazard map and the tribal population map of India which reveals that it's the tribal or marginalized who occupy vulnerable land as compared to better land by rich and sound.

5. **Lightning vs Tribal.** There is a direct relationship between the tribal population and the lightning. Since lightning strikes are more in open areas, jungles and water bodies, tribals staying with nature are more vulnerable to it. Their houses are katcha/ thatched roof and hence are not safe from lightning strikes. On comparing these maps It has also been observed that the it's the marginalised or tribals who in habitat in vulnerable areas and hence their casualty is maximum.

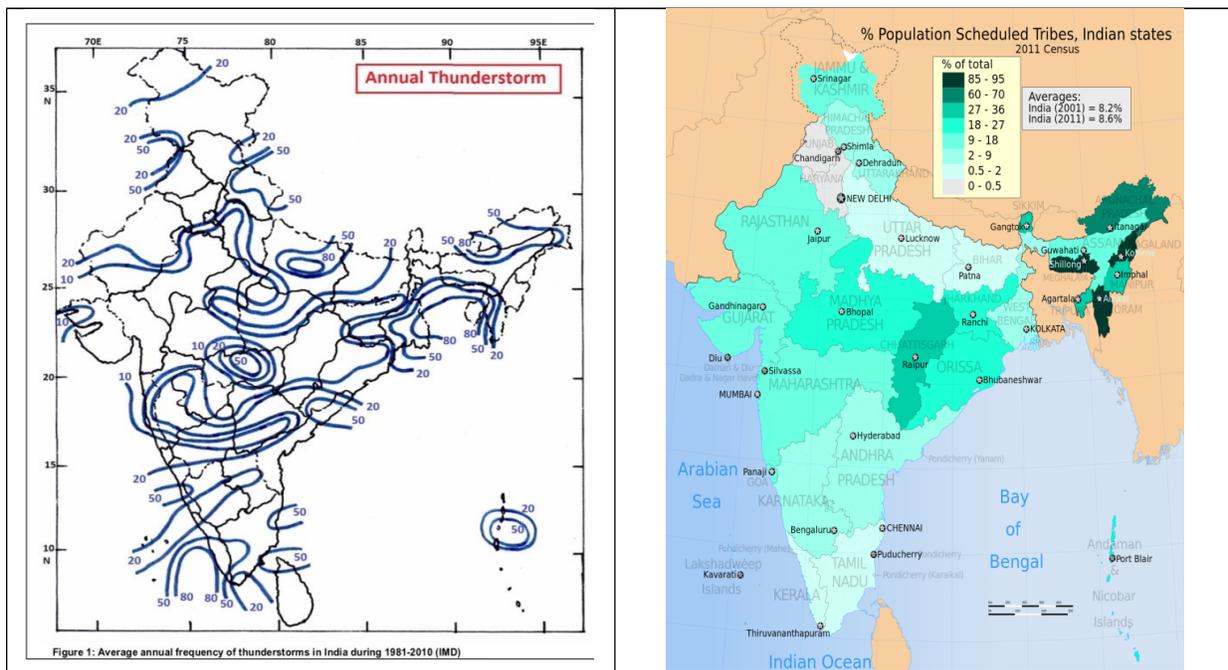


Figure 7: Annual Thunderstorm Map and Tribal Population map

The above maps clearly indicate the vulnerability of tribals which matches with the hazard and annual thunderstorms map of India .

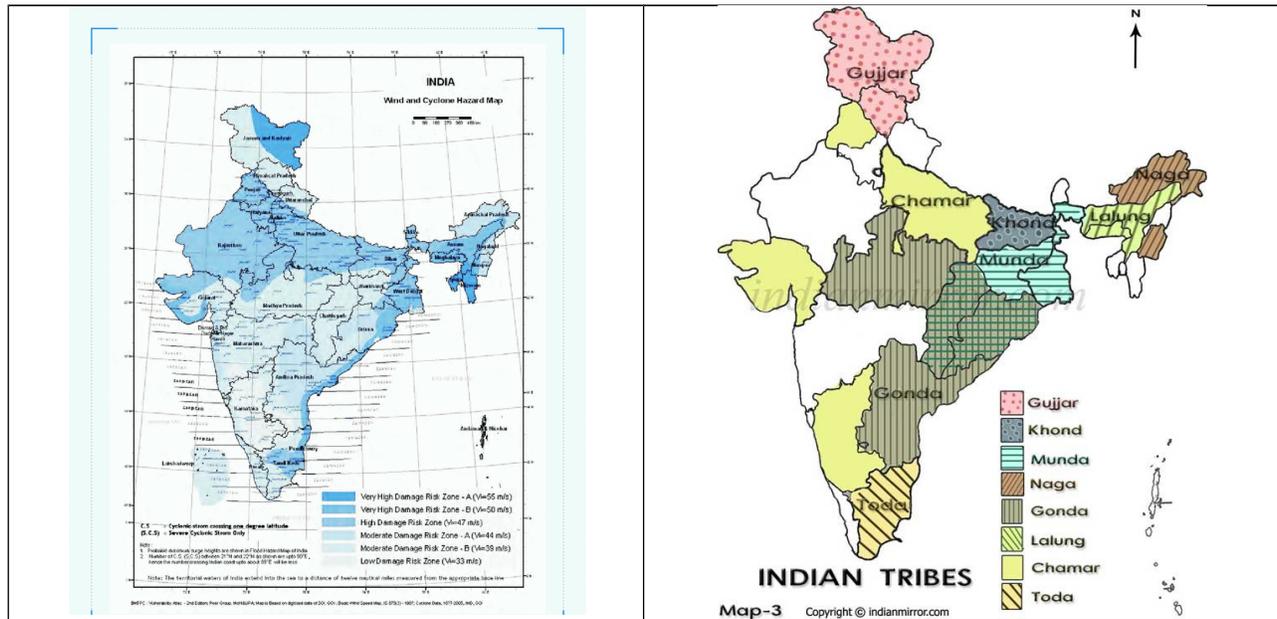


Figure 8 :Wind Hazard Map and Tribal Population map

The tribal population data as given below indicate a huge number of tribal communities who are affected which includes few extinct ones like Birhor or Andamanese :-

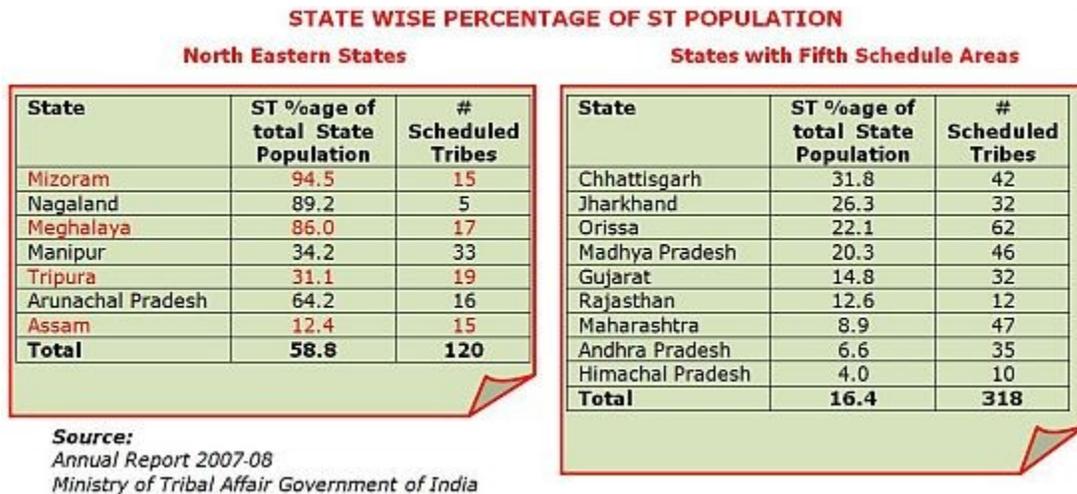


Figure 9: State wise population of Tribal in percentage

However, the tribal or marginalized locals cannot be moved out from these vulnerable zones as the natural habitat of sea, forest and local resources are integral part of their life

and they create a homogeneous eco system . Therefore, the effort should be address tribal and marginalised community for their safety against lightning .

Tribal vs Lightning : Case Study Jharkhand

6. Jharkhand has been one of the most prone to lightning due to two major factors – first is fast genesis of lightning due to it being a plateau and abundance of low level cloud and second is abundance of metallic ores in the soil attracting the lightning towards the ground . Please see the map below of two surveys one by IMD for period 1979 to 2010 and second by Birla Institute of Technology, Mesra Ranchi for period 2008-2012 with the help of NASA . On close scrutiny , it is observed that the lightning counts that is frequency of lightning has gone up by 9 times in Sighbhum region of South Jharkhand and atleast 3-4 times in rest of Jharkhand . Since these tribals still believe as their right to stay with nature . In fact , they are the most environment friendly human beings and they conserve both flora and fauna . There is a balanced ecosystem which tribals create and there is harmonious living . However despite being most environment friendly, tribals have to bear the wrath of nature and so high casualties of life , livestock and livelihood is recorded.,

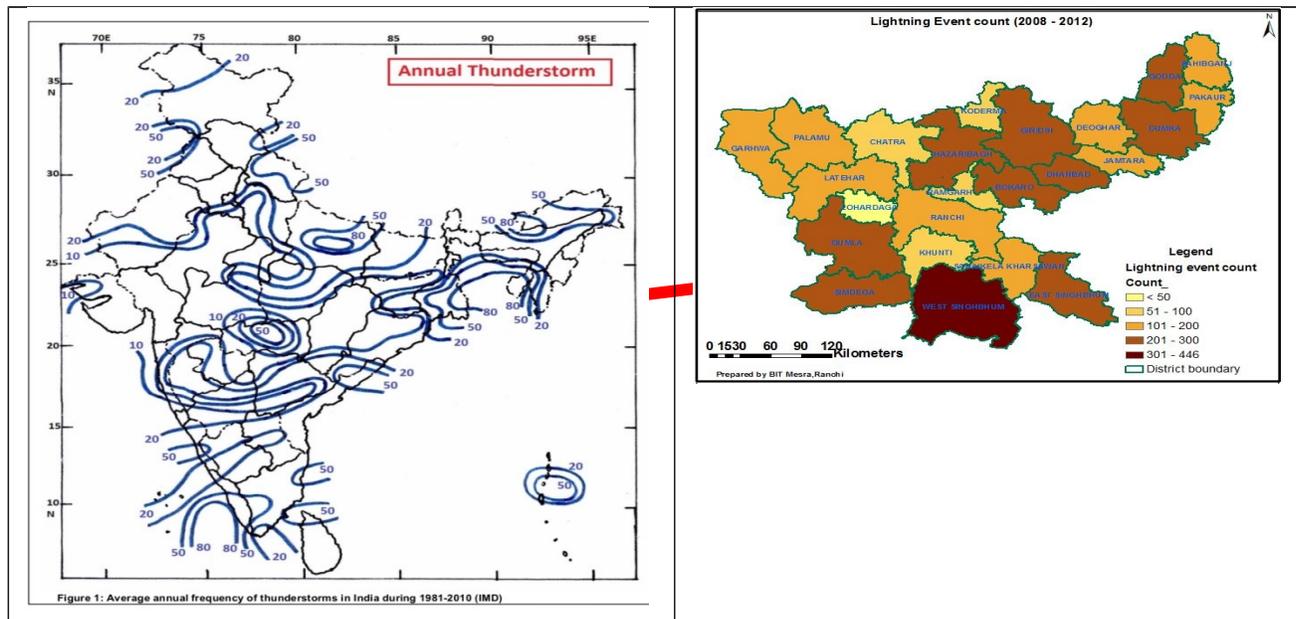


Figure 10: Annual Thunderstorm Map and Jharkhand Lightning vulnerability map

Please see the map of Munda and Ho tribes in the map given below and compare it with lightning vulnerability map of Jharkhand beside it . It's the Kolhan area where there is

maximum concentration of tribals and this area has generally highest number of casualty due to lightning even to the extent of more than 50 deaths per district per year. This calls for review in our approach .

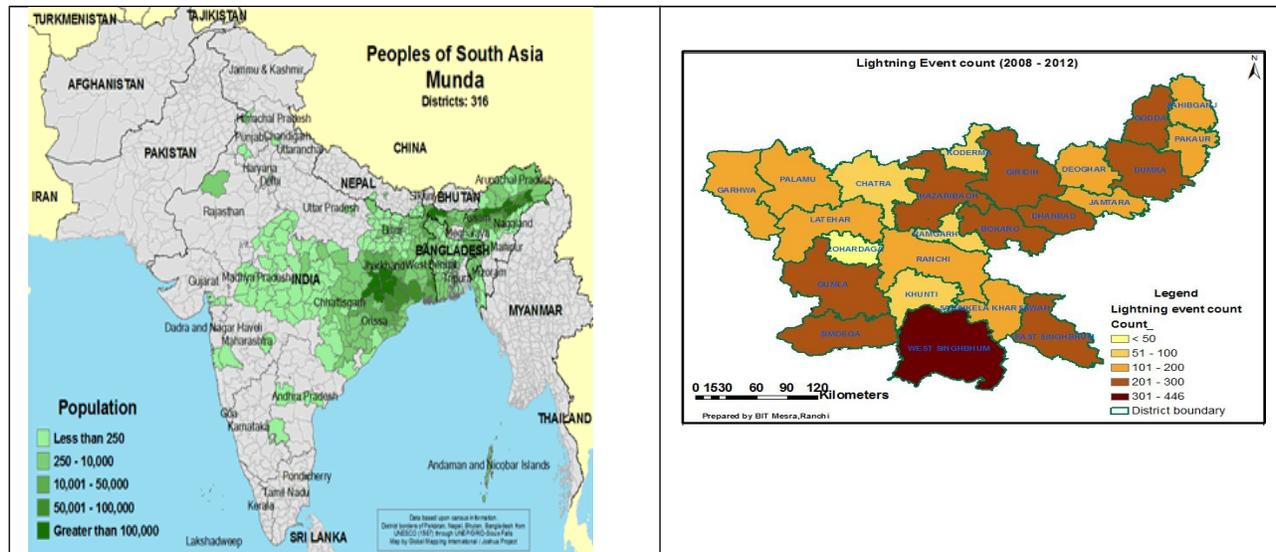


Figure 12: Munda Tribal population Map and Jharkhand Lightning vulnerability map

Tribal vs Lightning : Case Study Odisha

7. As per the Odisha State Disaster Management Authority, more than 1256 deaths were recorded in Odisha due to lightning in 03 years from 2015-16 to 2017-18. Please see the map below and compare it with the tribal map of India and ST population map of Odisha . The maximum deaths recorded was 130 from Mayurbhanj followed by 95 from Balasore . Its pertinent to mention that Mayurbhanj has more than 57.87% of tribal population. Similarly the lightning deaths are high in other tribal areas of Sundergarh, Keonjhar etc also. A comprehensive strategy towards saving life of these marginalised tribal is call of the day. Humanitarian agencies need to pay attention besides the efforts of Government to minimise the deaths due to lightning and thunderstorms and other extremes .

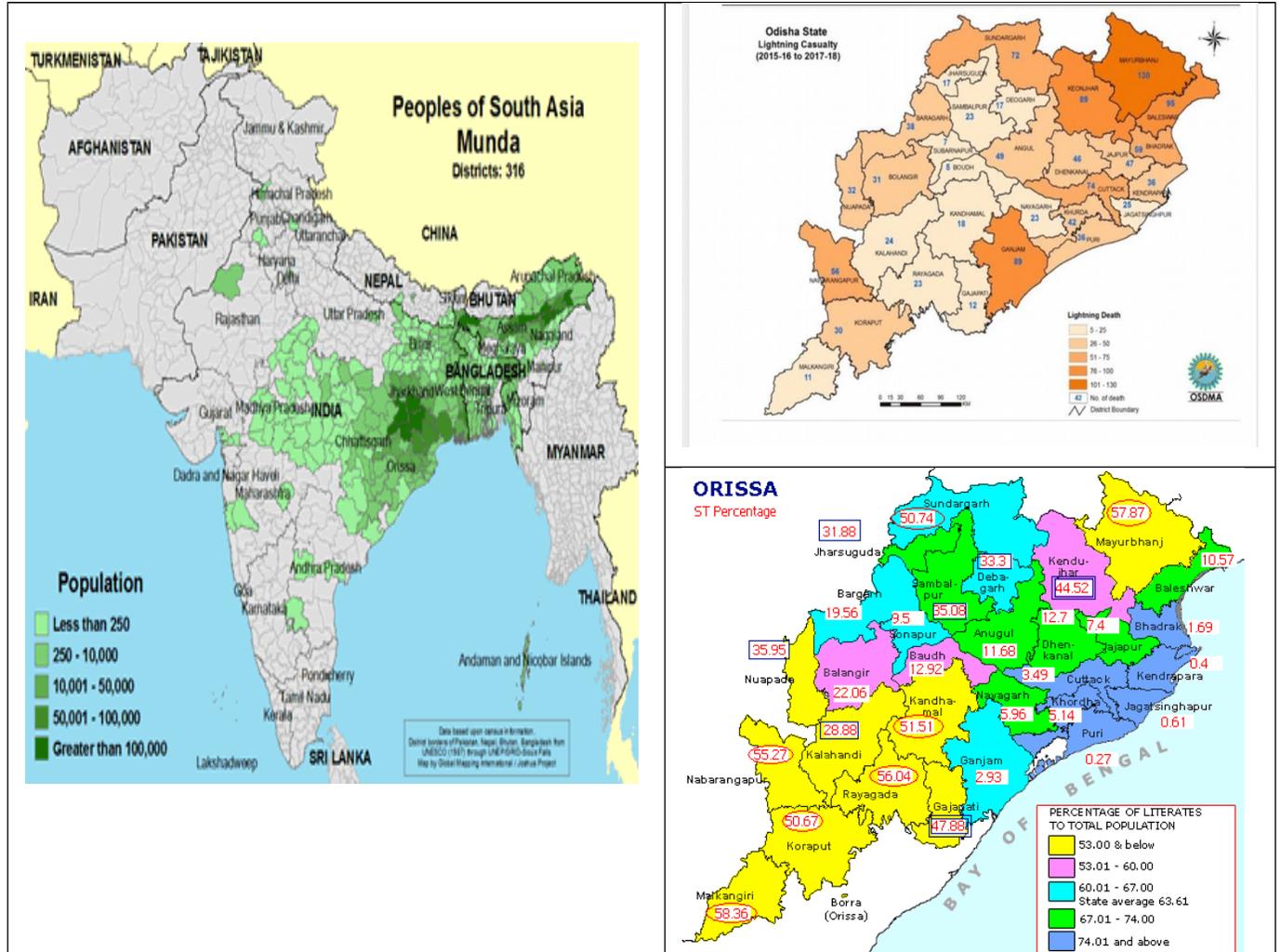


Figure 13: Munda Tribal population Map and Jharkhand Lightning vulnerability map

8. **High Tech Aggressive initiative by India** - Indian Meteorological Department (IMD), National Remote Sensing Center (NRSC) have done innovative work in mapping lightning proneness, its frequency and intensity . The Lightning forecast 24 hours in advance is a unique product of IMD . On the lines of U.S.A and European countries , in India too a plethora of information about lightning detection and prediction has been set up and launched by Indian Meteorological Department (IMD), National Remote Sensing Center (NRSC) and few state Governments and private weather players . A new app *Damini* has been launched by IITM Pune which is PAN India. States like Jharkhand, Andhra Pradesh , Odisha , West Bengal had/have also undertaken initiatives. However, the lightning deaths are still on rise.

There are number of mobile app based alert systems like app Vajrapat of Andhra Pradesh, Sidulu of Karnataka , Satark of Odisha, Bijli of West Bengal and foreign weather companies apps of Weatherbug, Accuweather and Earthnetworks are in abundance. A high tech dissemination system has also been launched . The Lightning casualties in Urban areas remain contained but the rural fatalities are rising alarmingly .

9. Non community centric approach -The main reason to the rising trend in death is due to Highly scientific and urban population centric approach. Since 97% victims are rural , they need to be targeted . This rural community of marginalized /tribals live off the land and their main professional is farming, fishing or jungle . They have very little access to the modern world or the Smartphone based devices . The farmers are in the field and the rural lady, past mid day is generally in jungle in search of firewood or alternative livelihood . Similarly the children play football or hockey in open areas around the village. In these far-flung areas, the reach of communication or mobile phone is hardly there . The awareness campaign by Government through TV, newspaper remain confined to city/semi urban areas. Thus the early warning or forecast for lightning being disseminated by the government does not reach the rural populace . The increase in number of fatalities due to lightning is its testimony and the dissemination system need to be strengthened .

10. Need to have Paradigm Shift in approach , Need is of rural community centric approach. There is a need to have a Paradigm shift in approach and an aggressive and comprehensive rural community centric approach has to be taken . The Lightning safety has to be undertaken as a campaign akin to election campaign wherein one has to go to door to door and generate awareness towards it . **Lightning Resilient India Campaign has started addressing the rural masses through Panchayats, Aanganwadis, village schools , distribution of leaflets, showing small audio and video advertisements , displaying banners , advocating about installation of lightning protection devices like Lightning Arresyers/conductors over school, panchayat Bhawan, market places, religious places etc.** Capacity Building is of utmost importance and will need to focus on the rural community and convey to the farmers ,the rural ladies , the village children about the do's and don'ts , **not to stand under tree in case of thunderstorm and lightning** .There seems to be a gross lack of awareness among rural masses about lightning for that matter they are not even aware that the government of India pays a compensation of rupees four lakh Per death . The rural livelihood pattern like fishing , swimming , open area in jungles, the cultivation etc. which are vulnerable to lightning strikes, need to be educated

to community .The community should also be properly sanitized with the risk of lightning so that people should identify the lightning indicators that is wind pattern , cumulonimbus cloud and specific training needs to be imparted along with awareness that there is a need to create lightning safe School , lightning safe Panchayat , lightning safe community centres , hospitals etc. The campaign has also decided to collaborate with Panchayati Raj institutions, rural development departments, social welfare departments , tribal welfare departments and livelihood missions so that larger section of rural masses are addressed. It has to be taken up like campaign door to door something akin to election . The illiterates and marginalised need to be educated about lightning safety Dos and Donts too.

The houses pattern of poors are also vulnerable to Lightning. The norms of Indira Aawas Yojna or Pradhan Mantru Awas Yojna are having roof of metal/tin sheets which attracts lightning. This should be changed to pucca concrete roofs. Even tiles are safe but not metal roofs.



Figure 14: Lightning strike on a rural house , damaged left corner of the house



Figure 16: Lightning strike on a rural poultry shade

There is also need to undertake traditional measures like planting of tree . Large number of trees absorb and dissipate energy of lightning strikes and make the area safe



**Figure 17: Lightning prone house in Gua tori village 85 km from Guwahati Assam :
an ideal house vulnerable to Lightning**

Livestock – Cattles, goats and hens form integral part of rural populations. The routine liquid cash flow to rural masses comes through these. The loss of livestock is loss of livelihood for farmers/ marginalised. There is a need to generate awareness towards safe cattle houses and safe poultries too. This would ensure safety of livestock.



Figure 18: Lightning strike kills 26 animals in Kanchipuram

The animals in the jungles are highly vulnerable and their deaths go unaccountable. A separate plan for wild animals also need to be worked out . Measures like cutting down of trees and groves , putting jungles on fire need to be banned to ensure a lightning safe habitat for wild animals .



Figure 18: Lightning protection for farmers , local innovatio

Lightning seems to have special relation with tribals. It seems to be affecting them most adversely. On close scrutiny of lightning death victims specially in Jharkhand Orissa West Bengal North East Kerala Madhya Pradesh Uttar Pradesh Chhattisgarh one is observed that most of the victims are from marginalized section of society whether a large number of them are from tribal community. Please see the newspaper report from Ranchi Newspaper Prabhat Khabar of 07 June 2019.

आपदा. बुंदू व तमाड़ में बारिश के दौरान ठनका गिरा

वज्रपात से एक की मौत, तीन घायल

प्रतिनिधि ▶ बुंदू

बारूहातु गांव निवासी शिवेंद्र भगत (48 वर्ष) शुक्रवार को वज्रपात की चपेट में आने से गंभीर रूप से झुलस गया. वहीं बिजला देवी (पति दिलीप यादव) घायल हो गयी. ग्रामीणों ने दोनों को बुंदू अनुमंडलीय अस्पताल पहुंचाया. जहां चिकित्सकों ने जांच के बाद शिवेंद्र भगत को मृत घोषित कर दिया. वहीं बिजला देवी को प्राथमिक उपचार के बाद रिम्स रेफर किया गया है. जानकारी के अनुसार शिवेंद्र भगत व कालीपदो दास बारूहातु गांव के बाहर सड़क किनारे बरगद पेड़ के नीचे झोंपड़ी बनाकर धान व लाह की

तमाड़ अस्पताल में चल रहा दंपती का इलाज

तमाड़. थाना क्षेत्र के नुरीडीह गांव में शुक्रवार की दोपहर वज्रपात से श्याम लाल अहीर (46 वर्ष) व उसकी पत्नी लखीमनी देवी (42 वर्ष) गंभीर रूप घायल हो गये. जानकारी के अनुसार पति-पत्नी खाना खाने के पश्चात घर में आराम कर रहे थे. इसी दौरान मौसम में बदलाव के साथ वज्रपात हुआ. जिसकी चपेट में आने से दोनों घायल हो गये. ग्रामीणों ने 108 एंबुलेंस से दोनों को तमाड़ अस्पताल पहुंचाया.




Figure 19: Newspaper Report of Prabhat Khabar covering lightning deaths in Ranchi

वज्रपात से दुमका में तीन, पीरटांड गोमिया व गुमला में एक-एक मौत

शुक्रवार को प्रदेश के विभिन्न इलाकों में तेज आंधी के साथ बारिश हुई. इस दौरान टनका गिरने से छह लोगों की मौत होने की सूचना है. अलग-अलग जगह हुई घटना में कई लोग घायल हुए हैं.

प्रभातखबर टोली >

दुमका. दुमका जिले के शिकारीपाड़ा प्रखंड के पत्थर औद्योगिक क्षेत्र के पिनरगढ़िया इलाके के एक क्रशर प्लांट प्लांट के दफ्तर पर शुक्रवार की देर शाम हुए वज्रपात में तीन मजदूरों की मौत हो गयी. दो की मौत घटनास्थल पर ही हो गयी, जबकि तीन अन्य मजदूर को बेहद ही नाजुक स्थिति में रामपुरहाट ले जाया गया है, जहां पहुंचने से पहले एक अन्य ने दम तोड़ दिया. शेष दो का इलाज चल रहा है. मृतकों और घायलों का नाम पता अभी नहीं चल पाया है.

गुमला में बच्ची की मौत : शुक्रवार को गुमला, बसिया व भरनो के कई इलाके में आंधी, तूफान व वज्रपात का कहर देखने को मिला है. आंधी, तूफान से

कई घर क्षतिग्रस्त हो गये. कई पेड़ जड़ से उखड़ गये. एक धर्मकुड़िया भवन ध्वस्त हो गया. इसी दौरान वज्रपात की हुई घटना में गुमला सदर थाना क्षेत्र के कुलाबिरा पंडरिया गांव निवासी वीणा कुमारी (13) की मौत हो गयी. वह कस्तूरबा बालिका की छात्रा थी.

केंदुआडीह में एक की मौत : खुखरा थाना क्षेत्र के कुंडको पंचायत स्थित केंदुआडीह गांव में वज्रपात से शुक्रवार की शाम शिवनाथ किस्कू (43) की मौत हो गयी है.

गोमिया में बच्चे की मौत, दो झुलसे: गोमिया प्रखंड अंतर्गत करी गांव में शुक्रवार की दोपहर वज्रपात से 11 वर्षीय सागर कुमार की मौत हो गयी. वहीं जगलाल महतो (35) व गणेश महतो (60) झुलस गये. घायलों को तत्काल गोमिया के आइइएल स्थित आर्डियर अस्पताल पहुंचाया गया, जहां इलाज चल रहा है. करी गांव में समारोह के दौरान वज्रपात होने से सागर कुमार समेत कई ग्रामीण चपेट में आ गये.

Figure 20: Newspaper Report of Prabhat Khabar covering lightning deaths in Ranchi

11. Lightning Resilient India Campaign has three major approaches :-
 - 11.1 National Level branding and action
 - 11.2 State Centric customized campaigning with State Governmnets and district administrations involving all stakeholders and partners of the campaign
 - 11.3 Local community level campaigning in panchayats and villages by Government , NGOs ,PRIs, University researchers
 - 11.4 Creation of Lightning safe Hutmets / villages/ rural market , schools hospitals, community centers etc. by installing Lightning arresters /conductors.

12. The main actions being undertaken are following :-
 - 12.1 Organising National and state level consultations and operationalise Lightning Action Plan including early warning. Work out effective and fastest means of dissemination to rural areas
 - 12.2 Capacity Building by education, awareness and training drive
 - 12.3 Sharing of IEC Materials on lightning safety like leaflets on Dos and Donts, small audio video educational/advisory materials , display of banners , Nukkad Natak, Public Announcements , Advisories through banners in school, panchayats, haat, bus stand, religious places , newspapers , FM, All India Radio programmes etc,
 - 12.4 Creation of Lightning safe Hutments like safe school. Lightning safe market, Lightning safe football field etc.
 - 12.5 Reviving innovative traditional practices on lightning safety including teach them innovative way of creating a lightning protection device and undertaking long term plan of tree plantation etc. for lightning safety .

13. In a country like India and with the huge task of creating lightning safe India , financial requirements is huge. But the social and emotional impact of lightning deaths of marginalised and tribals, their livestock and livelihood, Climate Resilient Observing Systems Promotion Council has undertaken the Lightning Resilient India Campaign along with

partner agencies . There has been tremendous goodwill response from the partners and target community but the financial support is meager and not forthcoming . The major levels of the Lightning Resilient India are campaign as given below:-

| Ser | Campaign Level | Effect |
|------|--|---|
| 13.1 | National Level Programmes , branding and actions through Government, Non Government and media for year 2019 | Will keep the campaign alive during most happening time .Will generate national /international level visibility |
| 13.2 | State Centric campaigning with State Governments and district administrations mobilizing volunteers village to village with strategic awareness and capacity building plan in states like Odisha, West Bengal, Jharkhand, Chhatisgarh, North East etc. | Will address marginalised community at grass root level bringing down the sharp decrease in losses . Will give visibility to the campaign |
| 13.3 | Creation of Lightning safe Hutments like safe school. Lightning safe market, Lightning safe football field etc. | A village of size 10 x10 km can be made Lightning safe and can be show cased to the world |
| 13.4 | Creation Lightning warning System cum Lightning safe center at Church , Community Center along with source of power, wifi grid ,communication etc | Unique equipment and a center of attraction for the village and other to emulate |

14. The Lightning resilient india with its shift in approach towards rural masses ,aims to achieve its target of reducing deaths by 80% in next 03 years. The campaign has also decided to collaborate with Panchayati Raj institutions, rural development departments, social welfare departments , tribal welfare departments and livelihood missions so that larger section of rural masses are addressed .The expert committee of the campaign will keep reviewing various aspects of lightning and will keep the government, Scientific organizations, NGOs, academia, community and others apprising of its findings and approach required to address lightning. The campaign also calls from all other organizations to join in to reach out to maximum rural masses