

Effects of Firecrackers: Adverse Impacts and Approaches for Eco-Friendly Alternatives

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Abstract

Firecrackers are essential in cultural and religious celebrations worldwide, symbolizing joy and community spirit. However, their increased use has led to harmful effects, including the release of toxic chemicals, noise pollution, and health risks for humans and animals. Growing awareness of these issues emphasizes the need to understand their environmental and health impacts, particularly in India, where firecracker usage causes severe pollution, high injury rates, and economic burdens.

This article examines the environmental, health, and social consequences of firecrackers, highlighting their negative effects on air quality, public health, and wildlife. It discusses strategies for sustainable change, including stricter regulations, eco-friendly alternatives, and public awareness campaigns. While firecrackers are deeply rooted in cultural traditions, their adverse effects necessitate a shift toward more sustainable practices. By adopting these strategies, communities can celebrate while minimizing harm and promoting environmental responsibility.

Key Words:- Firecrackers, Adverse Impacts and Approaches, Eco-Friendly Alternatives

Introduction:

Firecrackers play a central role in cultural and religious celebrations around the world, symbolizing joy, festivity, and community spirit. From national holidays to religious festivals and weddings, firecrackers are a long-standing tradition in many regions. However, as their use has grown, so have the associated negative impacts. Firecrackers release large amounts of harmful chemicals, particulate matter, and loud noise, contributing to environmental pollution and posing health risks for both humans and animals. With a rising awareness of these environmental and health costs, understanding the scope and impact of firecracker use is crucial to inform policy and encourage sustainable celebration practices. The extensive use of firecrackers globally—and particularly in India—leads to serious environmental and health consequences. Despite their cultural importance, the high rates of injury, pollution, and related economic burdens highlight the need for regulatory measures and educational initiatives to address these effects. By enforcing stricter controls, promoting eco-friendly alternatives, and raising public awareness, societies can move toward more sustainable ways of celebrating that reduce harm to both people and the environment.^{1,4}

The use of firecrackers has led to numerous incidents worldwide, with a significant impact on public health, safety, and the environment. Here is a breakdown of notable firecracker-related incidents and statistical data from both global and Indian contexts:

Global Firecracker Incidents

1. Injury Statistics:

United States: The U.S. Consumer Product Safety Commission (CPSC) reported that in 2022, fireworks-related injuries resulted in approximately 11,500 emergency department visits, with a high proportion of injuries among children and young adults. Nearly 20% of those injured were under the age of 15.²

United Kingdom: During Bonfire Night celebrations, an average of over 4,000 people visit emergency departments each year for injuries related to fireworks. The majority of these injuries occur in individuals under 20.^{3,4}

China: Despite stringent controls, China reports high numbers of injuries, particularly during Lunar New Year celebrations. However, recent measures limiting firecracker use in urban areas have significantly reduced injuries and pollution spikes.⁵

2. Pollution and Environmental Impact:

European Union: Studies from the EU have shown a marked increase in airborne particulate matter during New Year's Eve fireworks displays, with levels of PM10 and PM2.5 rising by as much as 500% in certain cities.⁶

Australia: During New Year's Eve celebrations in Sydney, PM2.5 levels typically spike, with the air quality index often exceeding safe limits by up to five times.⁷

Firecracker Incidents in India

1. Health Impact and Injuries:

Diwali-Related Injuries: India sees a significant increase in firecracker-related injuries during Diwali each year. In 2021, hospitals in major cities like Delhi, Mumbai, and Bengaluru reported over 1,200 cases of burns, eye injuries, and respiratory issues within a few days of the festival.⁸

Eye Injuries: The All India Institute of Medical Sciences (AIIMS) in Delhi has reported that nearly 30% of firecracker injuries are eye-related, often resulting in partial or complete blindness. Children are particularly vulnerable, with 50% of such cases occurring among individuals under 18.⁹

Respiratory Illness Spike: Respiratory hospitals in Delhi report a 30-40% spike in patient admissions for asthma and other respiratory illnesses during Diwali due to poor air quality caused by firecrackers.¹⁰

Cultural significance of firecrackers in festivals and celebrations globally.

Firecrackers carry rich cultural significance worldwide, symbolizing joy, triumph, and reverence. Traditionally used in celebrations, they represent themes like good fortune, protection, and communal joy, varying across cultures. Firecrackers evoke unity, celebration,

and remembrance, embodying identity, memory, and tradition despite environmental and health impacts. Their enduring presence reflects their deep cultural value across communities.¹¹

China: Lunar New Year and Traditional Festivals

Firecrackers have been central to Chinese New Year for centuries, originally used to scare off evil spirits like the mythical "Nian." In Chinese culture, they symbolize driving away misfortune and welcoming prosperity. The noise and light are thought to clear negative energy, creating a festive, joyful atmosphere that unites families and communities for a fresh start in the new year.^{11,12}

India: Diwali and Weddings

In India, Diwali, the Festival of Lights, is a major occasion for firecrackers, symbolizing light's victory over darkness and celebrating Lord Rama's return to Ayodhya. Firecrackers are believed to invoke blessings from Lakshmi, the goddess of wealth, guiding prosperity into homes. They also foster family bonds, as lighting them is a tradition shared across generations. Firecrackers add joy to weddings too, marking new beginnings with vibrant celebrations.^{12,13}

United States: Fourth of July

On American Independence Day, July 4th, firecrackers celebrate the nation's struggle for independence, echoing the "rockets' red glare" in *The Star-Spangled Banner*. Fireworks inspire patriotism and unity, symbolizing liberty and freedom. Families and communities gather to watch fireworks, fostering bonds and commemorating the country's history together.^{14,15}

Japan: Summer Festivals (Hanabi Taikai)

In Japan, firework festivals, or Hanabi Taikai, are a cherished summer tradition, symbolizing hope and the beauty of fleeting moments. The term "hanabi," meaning "fire flower," reflects Japan's appreciation of the ephemeral. Fireworks provide a moment of joy and reflection, uniting communities as people gather in traditional yukata to enjoy the displays and relax together, embracing a shared celebration of summer.^{16,17}

Spain and Latin America: Festivities and Religious Events

In Spain and Latin America, fireworks are integral to Catholic festivals, used in processions and saint's day celebrations as expressions of devotion and reverence. They symbolize festivity and community spirit, as seen in events like Las Fallas in Valencia. Firecrackers blend joy with respect for tradition, strengthening communal bonds in these religious and historical celebrations.^{17,18}

United Kingdom: Bonfire Night (Guy Fawkes Night)

Bonfire Night, celebrated on November 5th, commemorates Guy Fawkes' failed 1605 plot to destroy the British Parliament, with firecrackers symbolizing the prevention of chaos. Over

time, it has come to embody patriotism, unity, and resilience. Communities gather around bonfires and fireworks, celebrating history and creating shared memories.¹⁹

Importance of understanding both the impact of firecrackers on the environment and health.

Recognizing the environmental and health impacts of firecrackers is essential, as their effects are often overlooked. While firecrackers are integral to cultural celebrations worldwide, they bring significant environmental and public health costs. A deeper understanding of these impacts can help balance cultural traditions with the need to protect health and the planet. This awareness supports informed decision-making at all levels, enabling celebrations that are both joyful and safe for people and the environment.²⁰

1. Environmental Impact

Air Pollution: Firecrackers emit harmful pollutants like sulfur dioxide, nitrogen oxides, and particulate matter (PM2.5 and PM10), which significantly degrade air quality, especially in densely populated urban areas. These pollutants create immediate pollution spikes, contribute to smog, and reduce visibility.²¹

Soil and Water Contamination: Residues from firecrackers, including metals like lead, copper, and cadmium, settle in soil and may wash into water sources, harming soil quality, inhibiting plant growth, and posing risks to aquatic life.²²

Climate Impact: The carbon dioxide and greenhouse gases released from firecrackers add to global warming. Festival firecracker use can have a considerable carbon footprint, further driving climate change.²³

2. Health Impact

Respiratory Health: Pollutants from firecrackers, particularly fine particulate matter, can be inhaled deeply into the lungs, aggravating respiratory issues such as asthma, bronchitis, and other chronic pulmonary conditions. Children, the elderly, and individuals with pre-existing respiratory conditions are particularly vulnerable.²⁴

Noise-Induced Stress and Hearing Loss: The noise from firecrackers can reach dangerous levels, leading to hearing damage or loss, especially in children and older adults. Additionally, excessive noise pollution can increase stress, trigger anxiety, and disturb sleep patterns.²⁵

Eye and Skin Injuries: Firecracker explosions pose physical risks, leading to skin burns and eye injuries, which in some cases result in blindness. Many people, especially young children, are often unaware of these risks or do not exercise proper caution, leading to preventable injuries.²⁶

Mental Health Impact on Animals and Sensitive Individuals: Loud explosions can lead to stress, anxiety, and disorientation in animals. Pets and wildlife often experience intense fear, which can lead to dangerous behaviors. Sensitive individuals, especially those with

conditions like PTSD, may experience increased anxiety and distress during firecracker events.²⁷

3. Impact on Wildlife and Ecosystems: Firecrackers significantly impact domestic and wild animals, causing distress among pets, birds, and wildlife, with effects ranging from disorientation and nesting disruption to, in extreme cases, death. The noise and chemical pollutants from firecrackers disrupt ecosystems by altering natural behaviors and habitats, affecting the well-being of various species and destabilizing local environments.^{27,28}

4. Social and Economic Impact: Firecrackers can cause public nuisance, disrupting daily life with increased traffic accidents, noise discomfort, and pollution. They also carry economic costs, as healthcare systems bear the burden of treating firecracker-related injuries and pollution-induced illnesses. This raises a cultural debate around balancing traditional celebrations with the need for environmental conservation and public health.²⁹

Importance of Balancing Cultural Tradition and Environmental Health

Sustainable Celebrations: Awareness of firecrackers' impact can encourage the adoption of more eco-friendly celebration methods, such as green firecrackers, laser shows, or community-focused celebrations that reduce reliance on firecrackers.^{29,30}

Health and Safety Awareness: Understanding these risks highlights the need for public health education, particularly around festivals or events where firecracker use is common. Public awareness campaigns can promote safer practices and alternatives, helping to reduce injury rates.³¹

Policy Development and Enforcement: Knowledge of the health and environmental impact of firecrackers supports the development and enforcement of regulatory measures, such as timing restrictions, noise level limitations, and the banning of high-pollution firecracker types.³²

Strategies to Address Negative Impacts:

Addressing the negative impacts of firecrackers requires a combination of regulatory measures, public awareness, eco-friendly alternatives, and community-driven change. These strategies aim to reduce pollution, prevent health risks, and provide safer, more sustainable ways to celebrate traditions.³³

1. Policy and Regulatory Approaches:- Governments can address the harmful effects of firecrackers by banning those containing toxic substances like lead and mercury or regulating permissible chemicals. Restrictions on timing and duration, particularly during festivals, help limit noise and air pollution, reducing health risks for vulnerable populations. Legal noise limits for firecrackers, as implemented in countries like India, aim to minimize stress for humans and animals by capping decibel levels. Additionally, promoting or mandating eco-friendly "green" firecrackers, which produce less smoke, contain fewer harmful chemicals, and have lower noise levels, can further reduce environmental impact.^{33,34}

2. Promotion of Eco-Friendly Alternatives:- Green firecrackers, made with alternative chemicals to reduce emissions and noise, offer a more eco-friendly option for celebrations. Cities can also choose laser light and drone shows, which provide captivating displays

without air pollution or loud sounds. LED firework simulations are another popular alternative, creating visual effects with screens or synchronized lights, ideal for urban areas with strict pollution regulations. Additionally, shifting toward community-centered celebrations that emphasize cultural performances, music, and shared experiences can foster community bonds while minimizing environmental impact.³⁵

3. Public Awareness Campaigns:- Health and environmental education programs by governments, NGOs, and schools can inform the public about the risks of firecrackers, especially for vulnerable populations, promoting safer choices. Campaigns highlighting the impacts on pets and wildlife encourage responsible celebrations, including firecracker-free zones near animal habitats. Youth programs in schools can teach children about firecracker-related health and environmental issues, empowering them to advocate for sustainable celebrations and spread awareness within their families.^{35,36}

4. Community and Cultural Initiatives:- Promoting silent fireworks, which create vibrant displays without excessive noise, can help reduce noise pollution, particularly in residential areas. Establishing designated zones for firecracker displays in urban areas can also control noise and emissions, protecting nearby homes, hospitals, and wildlife zones. Additionally, community awards or incentives for eco-friendly celebrations can motivate neighborhoods to adopt sustainable practices, encouraging firecracker-free or low-noise events and inspiring others to follow their lead.^{36,37}

5. Incentivizing Sustainable Practices:- Offering tax benefits or subsidies for eco-friendly firecrackers can encourage their production and sale, making sustainable options more accessible. Additionally, community initiatives like tree planting or cleaning drives provide meaningful, eco-friendly alternatives to traditional firecracker celebrations, promoting a healthier environment and community spirit.^{37,38}

6. Scientific Research and Innovation:- Ongoing research into safer, less polluting firecracker alternatives can mitigate environmental and health risks, providing more sustainable options for celebrations. Implementing effective waste management solutions for firecracker residue can further reduce pollution and lessen the impact on landfills.^{38,39}

7. Technological Innovations:- Developing non-toxic firecrackers with fewer harmful emissions and biodegradable materials offers a safer, eco-friendly alternative, reducing environmental impact. Biodegradable fireworks packaging can also address post-celebration litter by naturally breaking down and lessening waste. Additionally, app-controlled or VR firework simulators allow people to enjoy the thrill of fireworks without physical firecrackers, providing a similar experience with minimal environmental harm.³⁸

8. Case Studies and Success Stories: Highlight examples of cities, states, or countries where firecracker restrictions or alternative celebration methods have been successfully implemented. Discussion of challenges and successes observed in these cases.⁴⁰

9. Enforcement and Monitoring:- Implementing real-time air quality monitoring during festival seasons can help track pollution spikes, enabling immediate responses and restrictions if necessary. Strict penalties for individuals and vendors who violate firecracker bans can reduce illegal use, with fines or legal action deterring non-compliance. Additionally, local and global partnerships between authorities, environmental organizations, and health agencies can foster the development of more effective, internationally recognized standards

for sustainable celebrations, ensuring a balance between cultural practices and environmental protection.^{40,41}

Conclusion

Through these strategies, societies can enjoy traditional celebrations while emphasizing environmental care and public health. A blend of regulatory actions, community involvement, and innovative alternatives can drive sustainable celebration practices, supporting cultural traditions in an eco-friendly way. Although firecrackers are integral to festive customs, their negative impact on health and the environment necessitates a move towards greener approaches. Implementing strict regulations, encouraging eco-friendly options, and raising public awareness can help reduce the adverse effects of firecrackers without eliminating their role in celebrations. As communities and governments worldwide become more attuned to environmental and health concerns, the shift toward sustainable festivities becomes more feasible.

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References

1. Saporito AF, Gordon T, Kim B, et al. Skyrocketing pollution: assessing the environmental fate of July 4th fireworks in New York City. *J Expo Sci Environ Epidemiol*. Published online August 6, 2024. doi:10.1038/s41370-024-00701-x
2. Winicki NM, Waldrop I, Orozco JV Jr, Novak D, Sheets NW. The epidemiology of firework-related injuries in the US, 2012-2022. *Inj Epidemiol*. 2023;10(1):32. Published 2023 Jul 4. doi:10.1186/s40621-023-00446-5
3. NHS England» NHS burns advice sought every 21 seconds over Bonfire Night weekend [Internet]. www.england.nhs.uk. Available from: <https://www.england.nhs.uk/2023/11/nhs-burns-advice-sought-every-21-seconds-over-bonfire-night-weekend/>
4. Gupta D, Bhatia C, Vignesh S, Sarabahi S. Firecracker Powder: A Unique Source of Burn Injuries. *Eplasty*. 2023;23:e61. Published 2023 Sep 14.
5. Chen S, Jiang L, Liu W, Song H. Fireworks regulation, air pollution, and public health: Evidence from China. *Regional Science and Urban Economics*. 2022 Jan;92:103722.
6. Tanda S, Ličbinský R, Hegrová J, Goessler W. Impact of New Year's Eve fireworks on the size resolved element distributions in airborne particles. *Environment International*. 2019 Jul;128:371–8.

7. Storey MA, Price OF. Prediction of air quality in Sydney, Australia as a function of forest fire load and weather using Bayesian statistics. *PLoS One*. 2022;17(8):e0272774. Published 2022 Aug 24. doi:10.1371/journal.pone.0272774
8. Yadav SK, Mishra RK, Gurjar BR. Assessment of the effect of the judicial prohibition on firecracker celebration at the Diwali festival on air quality in Delhi, India. *Environ Sci Pollut Res Int*. 2022;29(57):86247-86259. doi:10.1007/s11356-021-17695-w
9. Parija S, Chakraborty K, Ravikumar SR. Firework related ocular injuries in Eastern India - A clinico-epidemiological analysis. *Indian J Ophthalmol*. 2021;69(12):3538-3544. doi:10.4103/ijo.IJO_753_21
10. PTI. Delhi hospitals report 30-40% spike in respiratory cases as city grapples with rising pollution [Internet]. Deccan Herald. 2024. Available from: <https://www.deccanherald.com/india/delhi/delhi-hospitals-report-30-40-spike-in-respiratory-cases-as-city-grapples-with-rising-pollution-3245573>
11. The story behind fireworks in Chinese New Year celebrations. The Times of India [Internet]. 2024 Jan 19; Available from: <https://timesofindia.indiatimes.com/astrology/vastu-feng-shui/the-story-behind-fireworks-in-chinese-new-year-celebrations/articleshow/106984616.cms>
12. Wikipedia Contributors. Chinese New Year [Internet]. Wikipedia. Wikimedia Foundation; 2018. Available from: https://en.wikipedia.org/wiki/Chinese_New_Year
13. <https://www.facebook.com/wprnpublicradio>. The Chinese New Year - Colorful Traditions and Symbolisms - wprnPublicRadio.com [Internet]. wprnPublicRadio.com. 2024 [cited 2024 Nov 5]. Available from: <https://wprnpublicradio.com/chinese-new-year/>
14. Desk TL. Diwali 2024: Celebrate this Diwali responsibly with eco-friendly traditions and know ways to celebrate “Green Diwali” [Internet]. The Times of India. Times Of India; 2024 [cited 2024 Nov 5]. Available from: <https://timesofindia.indiatimes.com/etimes/trending/diwali-2024-celebrate-this-diwali-responsibly-with-eco-friendly-traditions-and-know-ways-to-celebrate-green-diwali/articleshow/114767822.cms>
15. When in Diwali in 2020? History, Significance, Importance, Story and all you need to know - Times of India [Internet]. The Times of India. 2023. Available from: <https://timesofindia.indiatimes.com/life-style/events/when-in-diwali-in-2019-history-significance-importance-story-and-all-you-need-to-know/articleshow/71723775.cms>
16. Someoneyouknow. Vedansh Craft [Internet]. Vedansh Craft. 2023 [cited 2024 Nov 5]. Available from: <https://vedanshcraft.com/blogs/news/lakshmi-the-goddess-of-wealth-and-fortune>
17. Firework Blog Articles About Everything Fireworks | Buy Fireworks [Internet]. Chorlton Fireworks. Available from: <https://chorltonfireworks.com/the-role-of-fireworks-in-diwali-celebrations>
18. Group C. Independence Day of India: A Celebration of Freedom and Unity [Internet]. <https://www.cimage.in/blog/independence-day-of-india-a-celebration-of-freedom-and-unity-81>. Cimage Group of Institutions; 2024 [cited 2024 Nov 5]. Available from: <https://www.cimage.in/blog/independence-day-of-india-a-celebration-of-freedom-and-unity-81>
19. Jepson A, Clarke A, editors. Exploring Community Festivals and Events. 2014 Oct 17;
20. Young N. Hanabi: The Sparkling Art of Japanese Fireworks [Internet]. Bokksu. 2024 [cited 2024 Nov 5]. Available from: <https://www.bokksu.com/blogs/news/hanabi-the-sparkling-art-of-japanese->

[fireworks?srsId=AfmBOooxV5CigM0okM4Z_sc0plA_suSHgXyl0SPERzp7t3AbutJN7riz](#)

21. Shah R, Limaye S, Ujagare D, Madas S, Salvi S. Personal exposures to particulate matter <2.5 μm in mass median aerodynamic diameter (PM_{2.5}) pollution during the burning of six most commonly used firecrackers in India. *Lung India*. 2019;36(4):324-329. doi:10.4103/lungindia.lungindia_440_18
22. Rashid A, Schutte BJ, Ulery A, Deyholos MK, Sanogo S, Lehnhoff EA, et al. Heavy Metal Contamination in Agricultural Soil: Environmental Pollutants Affecting Crop Health. *Agronomy* [Internet]. 2023 Jun 1;13(6):1521. Available from: <https://www.mdpi.com/2073-4395/13/6/1521>
23. Conservation International. What is a carbon footprint [Internet]. Conservation International. 2023. Available from: <https://www.conservation.org/stories/what-is-a-carbon-footprint>
24. Tanda S, Ličbinský R, Hegrová J, Goessler W. Impact of New Year's Eve fireworks on the size resolved element distributions in airborne particles. *Environ Int*. 2019;128:371-378. doi:10.1016/j.envint.2019.04.071
25. National Institute on Deafness and Other Communication Disorders. Noise-Induced Hearing Loss [Internet]. NIDCD. 2018. Available from: <https://www.nidcd.nih.gov/health/noise-induced-hearing-loss>
26. Parija S, Chakraborty K, Ravikumar SR. Firework related ocular injuries in Eastern India - A clinico-epidemiological analysis. *Indian J Ophthalmol*. 2021;69(12):3538-3544. doi:10.4103/ijo.IJO_753_21
27. Grigg EK, Chou J, Parker E, Gatesy-Davis A, Clarkson ST, Hart LA. Stress-Related Behaviors in Companion Dogs Exposed to Common Household Noises, and Owners' Interpretations of Their Dogs' Behaviors. *Front Vet Sci*. 2021;8:760845. Published 2021 Nov 8. doi:10.3389/fvets.2021.760845
28. Han J. Crowd-Pleasing Fireworks Are Not So Pleasing to the Planet [Internet]. Earth.org. 2023. Available from: <https://earth.org/environmental-impact-of-fireworks/>
29. Dhiman R, Mahalingam K, Balakrishnan N, Kumar A, Saxena R, Sihota R. Effect of legislation and changing trends of Diwali ocular firecracker injuries in Northern India. *Oman J Ophthalmol*. 2022;15(1):61-68. Published 2022 Mar 2. doi:10.4103/ojo.ojo_303_21
30. Saha A, Pal SC, Chowdhuri I, Ruidas D, Chakraborty R, Roy P, et al. Impact of firecrackers burning and policy-practice gap on air quality in Delhi during Indian's great mythological event of Diwali festival. *Cities*. 2021 Dec;119:103384.
31. National Institutes of Health. NIH Public Health Campaigns [Internet]. Office of Disease Prevention. 2019. Available from: <https://prevention.nih.gov/research-priorities/dissemination-implementation/nih-public-health-campaigns>
32. Han J. Crowd-Pleasing Fireworks Are Not So Pleasing to the Planet [Internet]. Earth.org. 2023. Available from: <https://earth.org/environmental-impact-of-fireworks>
33. Abdurrahman MI, Chaki S, Saini G. Stubble burning: Effects on health & environment, regulations and management practices. *Environmental Advances* [Internet]. 2020 Dec 1;2:100011. Available from: <https://www.sciencedirect.com/science/article/pii/S2666765720300119>
34. Briffa J, Sinagra E, Blundell R. Heavy metal pollution in the environment and their toxicological effects on humans. *Heliyon*. 2020;6(9):e04691. Published 2020 Sep 8. doi:10.1016/j.heliyon.2020.e04691
35. Green crackers for Deepavali: Festive fun with less fumes and noise - Happiest Health [Internet]. Happiest Health. 2024 [cited 2024 Nov 10]. Available from: <https://www.happiesthealth.com/articles/pulmonology/why-choose-green-crackers>

36. Ramírez AS, Ramondt S, Van Bogart K, Perez-Zuniga R. Public Awareness of Air Pollution and Health Threats: Challenges and Opportunities for Communication Strategies To Improve Environmental Health Literacy. *J Health Commun.* 2019;24(1):75-83. doi:10.1080/10810730.2019.1574320
37. Joshi D. Indian Journal of Integrated Research in Law FIRECRACKERS IN INDIA: A BRIEF REVIEW OF DECISIONS OF THE COURTS [Internet]. [cited 2024 Nov 10]. Available from: <https://ijirl.com/wp-content/uploads/2023/06/FIRECRACKERS-IN-INDIA-A-BRIEF-REVIEW-OF-DECISIONS-OF-THE-COURTS.pdf>
38. Seed. Eco-Friendly Diwali Crackers 2024: Seed Crackers with Green Crackers | Archan Fireworks [Internet]. Archan FireWorks. 2024 [cited 2024 Nov 10]. Available from: <https://archanfireworks.com/blog/eco-friendly-diwali-crackers-2024>
39. Ankit, Saha L, Kumar V, Tiwari J, Sweta, Rawat S, et al. Electronic waste and their leachates impact on human health and environment: Global ecological threat and management. *Environmental Technology & Innovation* [Internet]. 2021 Nov;24(102049):102049. Available from: <https://www.sciencedirect.com/science/article/pii/S2352186421006970>
40. Illiyas FT, Mani SK. Routine to Rare Risk - A Case Study of Firecracker Explosion Disaster in India. *PLoS Curr.* 2018;10:ecurrents.dis.d5a27e47c8decdbd4263813a15c47e07e. Published 2018 Sep 27. doi:10.1371/currents.dis.d5a27e47c8decdbd4263813a15c47e07e
41. The importance of having a real-time air quality monitoring network for wildfire season [Internet]. Clarity.io. 2023. Available from: <https://www.clarity.io/blog/consequences-of-wildfires-for-air-quality-why-important-to-have-real-time-air-monitoring-network-for-wildfire-season>