



**REPORT ON THE  
CITIZENS AND SELLER'S  
PERCEPTION ON FIRE  
CRACKERS IN  
BENGAL**

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## EXECUTIVE SUMMARY

Air pollution is widely recognized as one of the largest silent killers and it is concerning that India has the highest death rate in the world due to air pollution and 40% of that is credited to Bengal, Maharashtra and UP. Over the last couple of years, Bengal's air quality has seen massive levels of degradation and hence many of Bengal's denizens in cities like Kolkata, Durgapur, Asansol etc have already started experiencing the harmful consequences of it. What is more threatening is a massive increase in the COVID-19 cases across the state, especially in the city of Kolkata. Flourishing over the years as a major metropolitan city in India, Kolkata's air quality is falling even below Delhi's air quality standards and yet there are meagre public efforts drawn towards this end.

The *Report on citizen's and sellers' perception on firecrackers* aims to give valuable insights on the pressing issue of why it is both urgent and extremely necessary to adopt the norm of celebrating Diwali or any cultural occasions or ceremonies in a low emissions fashion so that we do not indulge in joy and festive vigour at the cost of the environment or the health of our fellow citizens. The report is based on primary and secondary compilation of data on the basis of a survey and citizen's poll of **677 citizens from Bengal and 23 firecracker sellers from 3 major firework markets in and around Kolkata**, conducted as a part of **SwitchON Foundation's Bengal CAN initiative** on the use of firecrackers in Diwali focussing especially on the perception of both buyers and sellers on celebrating Diwali with minimal emissions using **green firecrackers** as a norm for the present as well as the future. Analysis of the data reveals the following **key findings**-

- **About and 35% of the population have voted in favour of a complete ban** in the use of all types of firecrackers (including green firecrackers). Hence, the remaining 70% needs to be sensitized about the issue on a priority basis.
- **70% of the population of citizens surveyed do not claim green firecrackers to be popular majority** because they are **expensive and not easily available in the market**.
- **About 64% of the population have voted that they are willing to buy green firecrackers even if they are expensive.**

- **Almost 43%** of the firecracker sellers interviewed sell green firecrackers and about **80% of these green firecracker sellers have only less than 25% stock of green firecrackers.**

Since the past 3 years, we have extensively worked on this issue with multiple stakeholders under the campaign "Kolkata Clean Air". Owing to its urgency to reduce air pollution across the state, we have set up [Bengal Clean Air Network \(Bengal-CAN\)](#) – a network of youths, medical professionals, conscious citizens, NGOs, government bodies and other key stakeholders to take action and involve in policy advocacy to combat air pollution in Kolkata. To make this report useful for policy practitioners and decision makers, we have also implicated certain policy realignments to adopt a regime of no emission celebrations while also being mindful of the livelihoods of the people involved in the industry. Some of them goes as follows –

- **Curb in the levels of both noise and air pollution should become a regime of celebration for long term including a graded approach by the government for a behavioural shift in the citizens.**
- **Adoption of green firecrackers in place of conventional firecrackers restricted to only certain areas and for a limited period of time.**
- **Allotment of a specified time slot for bursting of firecrackers for a less concentrated smoke layer.**
- **Individual efforts by citizens should be given priority by mass sensitization of the citizens.**
- **Adopting a livelihood centric approach for the people engaged in the firecracker industry and providing them with alternative sustainable livelihood choices.**

As the wider objective of the report, we aim to advocate public policy in creating more awareness and sensitize the public about green and low emission firework while also addressing an alternative livelihood approach for people involved in the firecracker industry, one of the booming industries in Bengal. We welcome the recent high court ban (dated 05.11.2020) on bursting of firecrackers in light of COVID-19 spread in Kolkata and urge all citizens to celebrate Diwali responsibly.

We are positive that with the solidarity of each one of us we can achieve this grand dream.

## 1. INTRODUCTION

Urban areas, largely cities and towns occupy about 5% of the Earth's landmass but contribute to over 80% of the global CO<sub>2</sub> emissions thereby making the world's cities and towns major air pollution hotspots on this planet (Ghosh, S, 2011). Among several other environmental challenges in almost all metro cities around the world, air pollution has been emerging as one of the crucial environmental problems. Kolkata, being the 7<sup>th</sup> largest city in India and housing a total population of about 14,850,000 (United Nations- World Population Prospects) bears a rapidly deteriorating ambient air quality (Ghose, M.K.,2005). The World Health Organization (WHO) has estimated that urban air pollution is responsible for approximately 800,000 deaths and 4.6 million people lose their lives every year around the globe (The World Health Report 2019). The ever-increasing population of the city coupled with a complex geographical location with an intricate network of wind and precipitation phenomena, Kolkata's micro-climate is largely influenced by even minor changes in the particulate matters and toxic substances in the air added on occasions of excessive fuel combustions from within the city, agricultural stubble burning from surrounding rural areas and fire burning within the city.

Diwali is one of the largest festivals in India celebrated by over two-third of India's population over a span of 5-10 days starting usually in the month of October – November. Over the years Diwali/ Kali Puja in the city of Kolkata has been celebrated with religious vigor and carefree bursting of fireworks which contain high concentrations of atmospheric pollutants like SO<sub>2</sub>, NO<sub>2</sub>, carbon and other very highly toxic environmental pollutants (Singh et al. 2009). October and November are also the months of post harvesting season in rural parts of Bengal and hence a large population of farmers indulge in uncontrolled stubble burning thus generating even more harmful atmospheric pollutants. Hence, Kolkata's air quality dips drastically, reaching its lowest minimum ambient air quality with the onset of these months. The detrimental consequences of uncontrolled fireworks use are not a new environmental cum health hazard, but have received significant attention from health and environmental workers in recent years in most of the Indian cities with poor air quality such as Delhi, Ghaziabad, Punjab etc. Fireworks during the Diwali festival led to a short-term variation of air quality and two to three times increase in PM<sub>10</sub> and total suspended particulate concentration in Hisar city,

India (Ravindra et al. 2003). Having deadly health consequences of its own, adding fuel to the fire in the current situation is the massive spike in the COVID-19 cases in the city of Kolkata, which clearly implies that breathing a polluted air and the spread of the virus are directly related to each other and if unchecked, the spike in COVID-19 cases in Kolkata would be seeing an uncontrolled increase. A The study, published in Cardiovascular Research today, estimated that about 15% of deaths worldwide from COVID-19 could be attributed to long-term exposure to air pollution. In Europe the proportion was about 19%, in North America it was 17%, and in East Asia about 27% (Andrea, 2020)

In their CVR paper, the researchers write that these proportions are an estimate of “the fraction of COVID-19 deaths that could be avoided if the population were exposed to lower counterfactual air pollution levels without fossil fuel-related and other anthropogenic [caused by humans] emissions”.

**1.1 Objectives of the report:** This report therefore aims to cater to a plethora of stakeholders such as government bodies, NGOs, Civil Society Organizations, medical professionals, youths and to all citizens of Bengal who understand the magnitude of this pressing problem and are willing to take immediate action. The primary objectives which this report aims to deliver are as follows –

- Understanding the **general perception of both buyers and sellers on the use and market of firecrackers in West Bengal and their likeliness to give up bursting of any firecrackers or adopt a low emission/ green cracker for Diwali celebration as a way of celebrating any ceremonies.**
- The findings drawn from the research study and the policy implications provided at the end of the report would be useful in building a larger **citizen’s-based policy on a complete long term ban on firecrackers or high emissions firecrackers for Diwali/ Kali Puja celebrations (or for any ceremony whatsoever) in West Bengal** especially in the areas where the air quality is very poor and adoption of low emission green fire crackers in other areas with permissible standards of PM 2.5 and PM 10.
- This report also extends in **sensitizing a wider audience about the deadly combination of COVID-19 and air pollution for a city like Kolkata, West Bengal** which houses over 1.49 crores

population (United Nations – World Population Prospects) and how the bursting of firecrackers may simply worsen the situation which millions of people are battling.

- **Lastly and most importantly, the report aims in developing an alternative sustainable livelihoods approach for firecracker sellers in Kolkata** as a major portion of Bengal's GDP as well as the rural workforce are engaged with the fireworks industry located in the state and a complete embargo on the functioning of this industry would simply put thousands of the rural workforce into distress.



## 2. METHODOLOGY

A mix methodology of data collection was adopted to conduct this research study. For the purpose of capturing both the seller and the buyer's perception in the use of firecrackers and the access to the market for firecrackers and green crackers, two sets of data collection were undertaken – ***a citizen's perception survey*** and ***a market survey of the sellers of fireworks***. Both qualitative and quantitative data was collected as a part of the data collection using in person in-depth interviews of firework sellers and through an online poll filled by citizens voluntarily. To extrapolate the data received from the online citizen's survey, another interview of the citizens was carried out using the same interview schedule on a comparatively smaller sample size i.e. 50 respondents. Mostly qualitative data was collected using **Focused Group Discussions (FGDs)** and **in-depth interview schedule** from the firecracker sellers to understand in depth the present challenges in the market for green as well as non-green crackers. Secondary data was collated mostly from government and non-governmental reports and some from NGO reports. The sample of **677 citizens** were drawn randomly from all over West Bengal through networks and connections and the sample of **23 firework sellers** were drawn from **2 fireworks market** in the **Kolkata Metropolitan Area (KMA) –China Bazar and Howrah** and 1 fireworks market from **South 24 Parganas – Nungi Bazi Bazar**. A representative sample consisting of small, medium and large fireworks sellers has been surveyed for this study<sup>1</sup>.

**2.1 Study area and Sampling Design:** The sample of respondents for the citizens poll was drawn from all over West Bengal and the sample of firecracker sellers was drawn from Kolkata Municipal Area (KMA) and South 24 Parganas. While the citizen's survey was done on an online platform with respondents hailing from Kolkata, the sample of firecracker sellers were drawn from 3 main firecrackers markets in Kolkata selected purposely.

**China Bazar** is located in Central Kolkata and is believed to be one of the earliest neighborhoods in the region. This area was named after the heavy settlement of Chinese Hakka <sup>2</sup> immigrants in the 19<sup>th</sup> Century. Most of these immigrants were traders of jewellery and used to majorly work in the tanning

<sup>1</sup> Due to both time and sample constraints, the representative sample of small, medium and large firework sellers couldn't be structured statistically

<sup>2</sup> Hakka, sometimes Hakka Han are the Han Chinese people whose ancestral homes are chiefly in the Hakka speaking provincial areas of China



industries found in this region. Over the years, the presence of a wide array of street vendors and pop-up stores have flooded this area making this a market hub of all things from Chinese food to Chinese electronic items. In the months of October to December, almost all the roadside vendors in this region earn a hefty profit by marketing firecrackers and Diwali lights.

**Howrah** is located in the Howrah district of West Bengal and is a major industrial and commercial hub around the city of Kolkata. Being a major transportation hub of Kolkata, this region has flourished over the years in the market of several goods that are imported from other states as well as several other neighboring countries at cheap rates through both seaways and airways. Green firecrackers found in the firecrackers market of this region are mostly transported from different parts of India and hence the availability is intermittent.

**Nungi Bazar** is a neighborhood in the Maheshtala of the South 24 Parganas district of West Bengal. Located near a flourishing industrial locality, Nungi once had a booming fireworks industry and the “Chocolate Bomb” from this market remains well known among the residents of the state during Diwali festival. The ‘Bazi Bazar’ in this region is a cluster of outlets set up in the central part of the city, organized by a fireworks dealer’ body and supervised by the sand over 31 lakh artisans are involved in the art of making firecrackers and the sale of fire crackers form a major part of their living.



**FIG 1: Map of all the major firework markets in Kolkata and the South 24 Parganas from where the sample of firework sellers were drawn; Source: Google Earth Pro; extracted online on 05-11-2020**

The only limitation in the sampling frame was the purposive selection of firecracker sellers couldn't consider any firecracker seller from the major markets in South Kolkata such as Jadavpur and Gariahat market as the survey was done two weeks prior to Diwali and also the fire cracker sellers were apprehensive of profits through the sale of fireworks amidst an aura of rapidly increasing COVID-19 cases, air pollution and stringent government restrictions.

### 3. NEED FOR IMMEDIATE ACTION AND PUBLIC ADVOCACY

The status of Kolkata's degrading Ambient Air Quality (AAQ) Index is an urgent and pressing problem looming over the heads of Kolkata's top administrative bodies. Although substantial action for clean air in metro cities has already been initiated by several leading organizations and stakeholders, the need of the hour is to come up with a long term citizen's policy that would urge urban metro dwellers to reimagine and rethink a low-emissions lifestyle and likewise celebrate any ceremony with the least possible emissions thereby leaving behind a minimized carbon footprint per person. The real drivers of change in this initiative would be the city youths, mostly school and college students, who are more likely to bear the brunt of an impending environmental crisis in all the critical pollution hotspots in India if immediate action isn't taken. However, when talking about a complete switch to low emissions Diwali, the livelihoods of thousands of firework producers will be at stake if alongside a behavioral shift in the citizen's who are the real consumers of their products, we do not sensitize the public about how sustainable livelihood options can be raised and prompted among these sellers. Thus, the need for effective public advocacy coupled with conscious and responsible behavior of the citizens to move towards a low emissions way of living is what will determine the sustainability of any policies drafted towards this end

Data on Kolkata's air quality from CPCB reveal that PM 2.5 levels in Kolkata have been fluctuating over a time period four months from November 2019 to February 2020. The highest concentration of PM 2.5 was recorded in the months of December and January which are mostly the months of higher occurrences of stubble burning from rural adjoining areas of Bengal, heavy influx of tourists due to several festivities and ceremonies and high prevalence of religious and other ceremonies. The sudden drop in the PM 2.5 concentration in Kolkata in the month of January can probably be attributed to a data error from the air quality monitor or the presence of cloud cover.

### 3.1 Status of Air Pollution in Kolkata

The trend of a degrading air quality in Kolkata is not a new phenomenon but a long-standing issue. Air pollution in Kolkata has seen a massive dip over the last couple of years. Ever since the industrialization phase in West Bengal, pollution levels in Kolkata have been increasing in an uncontrolled and uneven fashion. The rampant exodus of rural-urban migration, congested road transportation, uncontrolled rise in city-based eateries and cooking joints along with a gigantic population of 1.49 crores coupled with an ineffective government control the concentration of PM 2.5 and PM 10 in Kolkata's ambient air quality have skyrocketed in the last 15-20 years. However, in recent years, the government and several other non-governmental bodies have come together to take action before the situation worsens and sensitize citizens on the lethal consequences of inhaling polluted air.

Some of the biggest contributors of atmospheric pollutants in Kolkata are diesel run vehicles (mostly good vehicles) and stubble burning in rural parts of Bengal. According to the transport department sources, much of the pollution is caused by goods vehicles coming from outside during the night time. Significantly, the movement of goods vehicles in the city is allowed in the city after 9 pm till 6 am the next day.

The other significant contributor of pollutants in Kolkata's air is from the agriculture sector in the surrounding rural areas of the city. After harvesting boro paddy, the farmers generally burn the stubble which causes a lot of pollution in these areas. These pollutants are carried away to the urban centers, mainly Kolkata by drifting winds, thus choking Kolkata's air with toxic pollutants. To combat this issue sensors are being planned to be installed by the West Bengal Pollution Control Board. The sensors will help in tracking any incident of stubble burning across the state and WBPCB scientists will inform the board's top officials who will coordinate with the administration. West Bengal Pollution Control Board to install sensors to detect stubble burning in the state to control air pollution

The city also plans to deploy 5,000 electric buses and fully electrify the ferries on the Ganges River by 2030. Air pollution was just one factor that pushed the West Bengal State Government to transition to

electric transportation. It also makes financial sense, since battery-operated buses are cheaper to run, with a third of the operational costs of a diesel bus. As of 2019 government sources, 80 electric buses have been introduced to the city, with another 100 planned for 2020. These 180 electric buses will lead to an annual reduction of 14,086 tonnes of CO<sub>2</sub> emissions.

### **3.2 COVID-19 and Air Pollution: A deadly combination**

According to studies done and supported by multiple organizations over the world, a pattern can be observed in the rise in the number of cases in areas with high pre-existing or current air pollution levels. The presence of mere particulate matters in the air facilitates the spread and manifestation of the coronavirus among individuals. Studies indicate that citizens residing in regions where the pollutant levels are slightly higher than other regions, are more susceptible to contracting the disease due to the higher and longer prevalence of pollutant particles in the air which act as excellent carriers for the pathogen. Seasonal respiratory infections like cough and cold during winters also pose a major threat to human health as a result of frequent social contact and rapid genetic evolution of microbes (Chen et al., 2020a). Individuals having compromised immune systems and underlying health issues (e.g. diabetes, hypertension etc.) are easily susceptible to the disease.

Analysis and comparison of Air Quality Index (AQI) in regions of the state of Kerala with countries witnessing higher numbers of infected persons shows that both regions had (frequently AQI>100) which is qualified as “Unhealthy” and even “hazardous” during winters. Another issue adding to the plethora of concern regarding air pollution and COVID, is the high UV index in the state, since UV index in West Bengal ranges within 6-10 in a polluted environment, the elevated levels of ground level ozone produced would further deteriorate air quality by which it infects the lungs to make a supporting platform for virus infection (Gerba et al., 2002)

### 3.3 COVID-19-firecracker-air pollution nexus

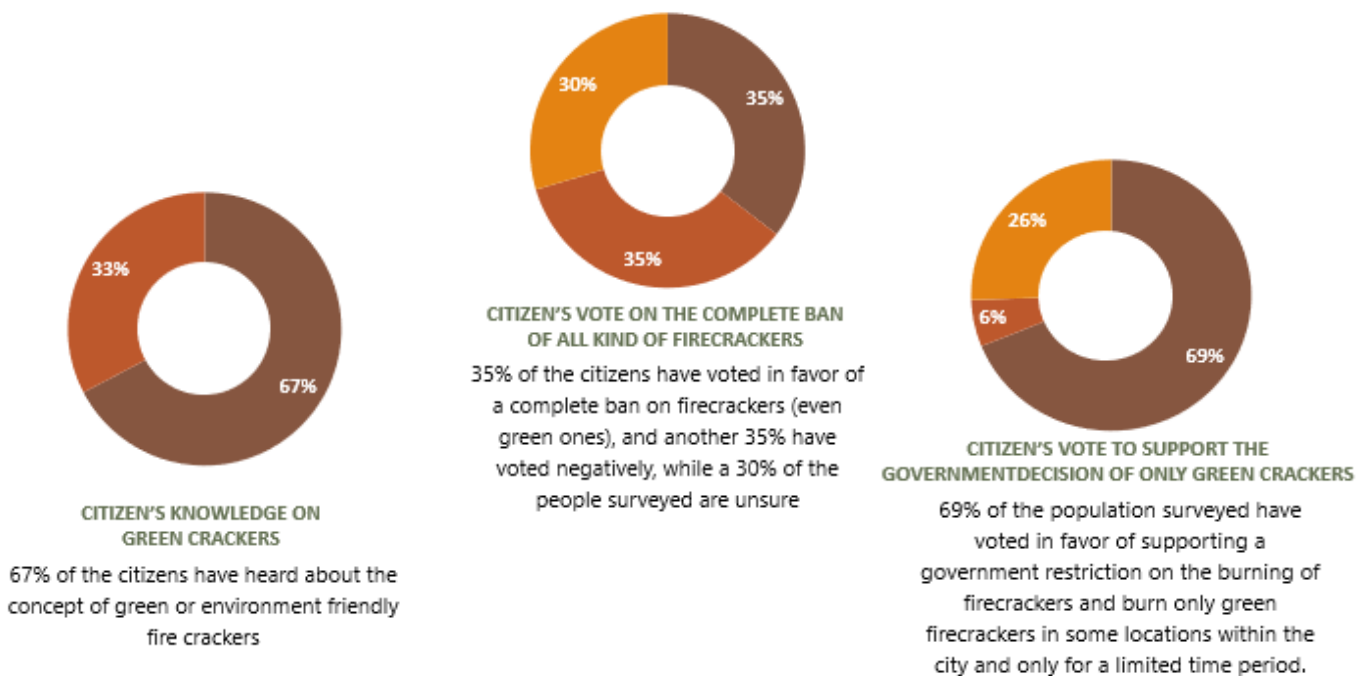
The WHO reveals that air pollution from both indoor and outdoor sources cause about 7 million deaths each year, most of which are due to heart and respiratory ailments. More than 80% of the world's population that resides in the urban areas are exposed to air quality that exceeds WHO's guideline levels, also, people belonging to low and middle-income countries face the highest brunt.

Research indicates that burning of firecrackers release not just smoke but a harmful cocktail of other toxic substances such as arsenic, manganese, aluminum, iron dust powder, barium nitrate along with sulfur dioxide, carbon dioxide and carbon monoxide. Not just the ones with pre-existing ailments, but healthy people experience the impacts of polluted air leading to symptoms like irritation or difficulty in breathing and headaches. Pollution-induced illness range from aggravated cardiovascular and respiratory illness and add stress to the heart and lungs, long-term exposure to polluted air can have an array of permanent health effects such as accelerated aging of the lungs; loss of lung capacity and decreased lung function; development of diseases or rapid worsening such as asthma, bronchitis, emphysema; and possibly cancer and shortened life span.

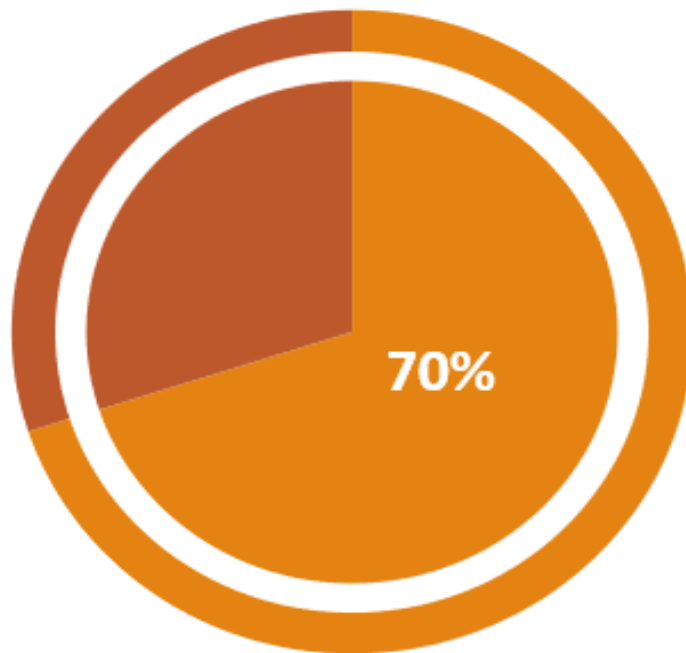
Another crucial factor to be taken into consideration while assessing bursting of fire-crackers and the resultant air pollution is the utter distress and inconvenience it causes for animals, and India having a very large population of stray animals, suffers heavily. The continuous bursting of firecrackers creates panic amongst them making them susceptible to getting injured from the fireworks.

## 4. CITIZEN'S PERCEPTION ON THE USE OF GREEN CRACKERS

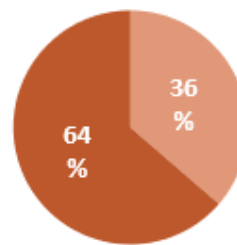
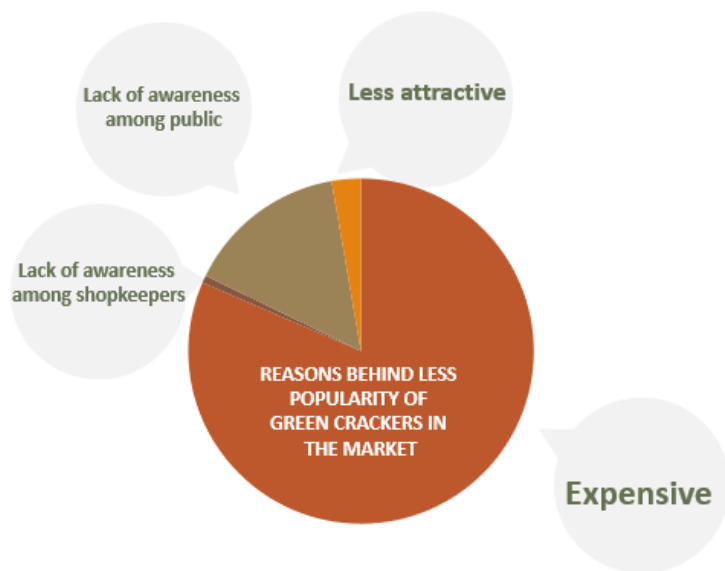
Green fire crackers<sup>3</sup> are low emission fire crackers as they emit 30% less particulate matter in the atmosphere. To make green crackers, pyrotechnic is used due to which the emission of Sulphur dioxide and nitrogen oxide does not occur. This is why using green crackers can control or curb the spike in pollution level. Basically, green crackers don't contain barium substance which is used in the firecrackers to add green colour. Barium can cause burns, poisoning and deaths. This is the reason why Green crackers claims to will reduce at least 30 percent emissions using particulate matter Potassium Nitrate as an oxidant. The interesting insights revealed from the citizen's poll regarding the use of green firecrackers have been presented through the series of infographics below-



<sup>3</sup> The box of green fire crackers will also have a QR code to scan with the camera lens from a smartphone. Scanning the code will open a link which will direct one to the details of the product. The CSIR logo is the logo of Centre for Scientific and Industrial Research, officially certified by NEERI -National Environmental Engineering Research Institute.



**70% of the population voted that 'Green crackers' are not popular in the market**



**Willingness to pay for green Firecrackers at a higher price**



422 out of the total 677 respondents surveyed voted that they are willing to buy green crackers, even if they are expensive. This indicates that almost 64% of the citizens surveyed were conscious about the fact that firecrackers are composed of major pollutants and hence a switch to cost-effective green crackers would be necessary to adopt.





14%

**CITIZENS KNOW THAT GREEN CRACKERS ARE THE ONES SOLD IN GREEN PAPER BOXES**

Green crackers can solely be identified by the presence of the CSIR certified mark and the QR code regardless of the colour of the box it is sold in. Any product sold in a green paper box is not necessarily a green cracker

19%

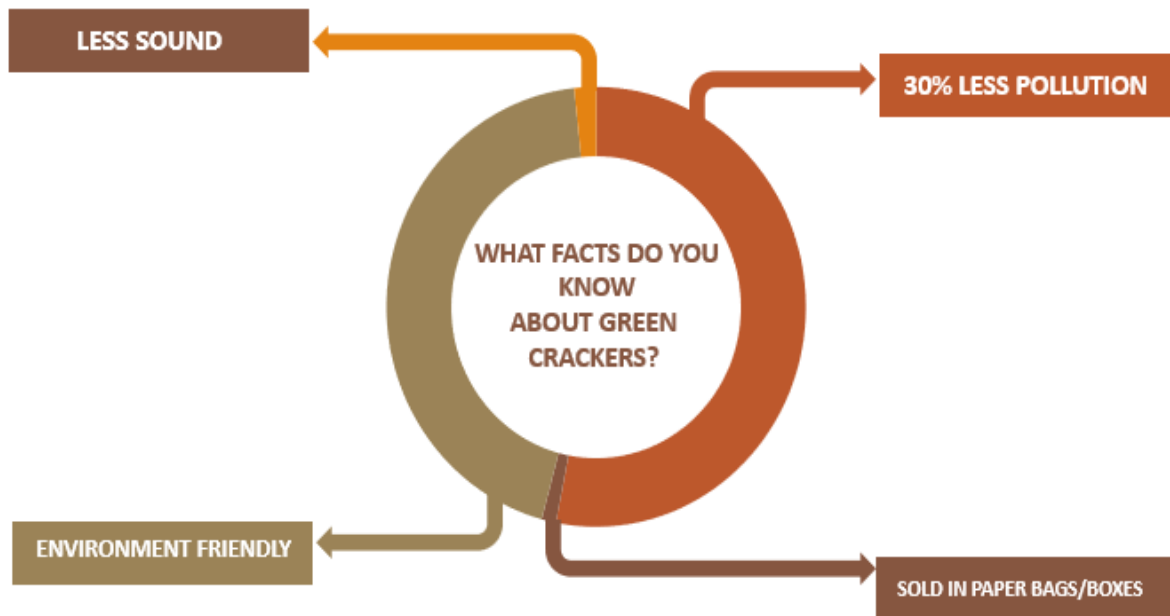
**CITIZENS KNOW ABOUT BOTH THE CSIR GREEN CRACKER LOGO AND THE QR CODE**

The CSIR logo is just a mark of the firework certified by NEERI as a 'green firecracker'. However, the QR code in the box is the most important element as it helps the consumer track the chemical composition of the firework by simple scanning it to crosscheck the authenticity of the product.

61%

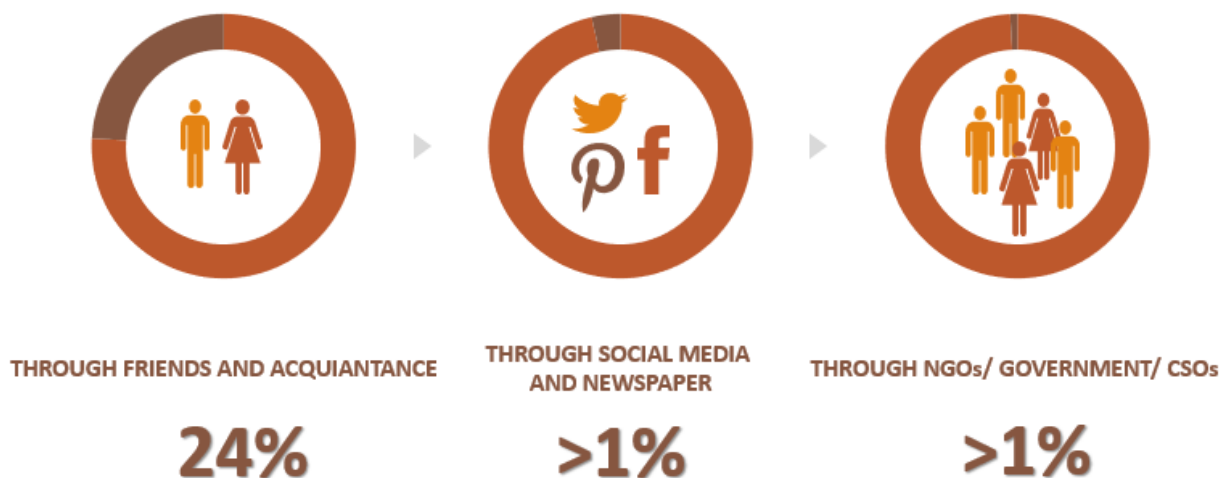
**CITIZENS KNOW ABOUT THE CSIR GREEN CRACKER LOGO IN THE BOX**

The CSIR NEERI certified logo is a mark that the firework is composed of less pollutive substances and hence it produces 30% less pollution than a normal firecracker



The citizens poll revealed that although 67% of the population are aware of green-crackers, there is a major 33% of the population who have not heard about the concept at all. The major reasons behind this unpopularity of green crackers are that almost 60% of the population believe that green crackers are expensive and also there is less awareness among the public regarding the concept of low emission fireworks. However, the greener side of the story is that more than half of the population surveyed were willing to buy green crackers even if they are expensive, which simply put is an indicator that a reduction in the costs of the green crackers would incentivize many citizens to make a complete switch from non-green to green crackers. Interestingly, not all citizens know about both the R code as well as the CSIR logo in the box of the firecracker for identifying it as a green firecracker. Only 19% of the population know both about the CSIR logo and the QR code.

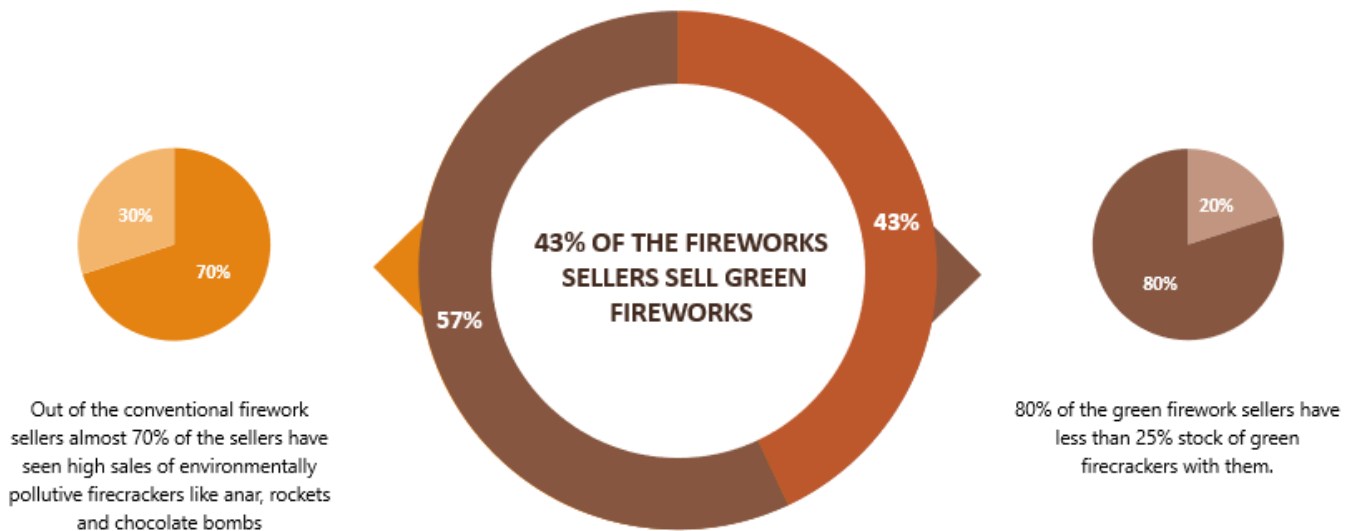
35% of the population surveyed voted in favor of a complete ban on the firecracker (both green and non-green ones), which is an indication that people are reluctant to compromise on festivities and ceremonies and celebrate them in the conventional way like several other years. This also indicates that a switch to green firecrackers would willingly be adopted by this section of the population if prices are made reasonable and availability is maintained. However, the bottom-line is that green firecrackers are still environmentally pollutive, even if they claim to cause a 30 % reduction in the particulate matter pollution in the air.



Hence, there is a pressing need to have a larger public advocacy on adopting sustainable celebration ideas as a long-term solution to the issue, not just for one year but for several years down the road. Coupled with that, the decision to allow the bursting of green firecrackers should also be accompanied by a couple of restrictions regarding the time period and places of bursting them. Also, the poll revealed that the popularity of green firecrackers was mostly through friends and acquaintances and very little through governments, NGOs, newspapers and social media. This is where the NGOs and Civil Society Organizations can play a significant role.



## 5. SELLER'S PERCEPTION ON FIRE-CRACKERS



The survey of firecracker sellers revealed interesting insights on how the current market of firecrackers has been affected by the current pandemic situation and the looming air pollution crisis in the city of Kolkata. Almost the majority of the firecracker sellers were of the opinion that they understand that the firework products sold by them consisted of hazardous chemicals which are environmentally pollutive and when these pollutants are released in the atmosphere, they interact with COVID-19 aerosol particles and helps in easy transmission of the virus. However, the limiting factor which most of these firecracker sellers expressed was the lack of awareness among the firecracker sellers about the authentic CSIR certified green fireworks and how their chemical compositions are different from the conventional firecrackers.

Manik Das, a firecracker seller in Kolkata's largest firecracker market, Nungi Bazar in Mahestala of South 24 Parganas exclaimed - *"Switch to green crackers is good, but awareness among the firecrackers sellers along with infrastructural development of the local factories is very urgent"* (Field 2020). Further on the lack of training and availability of green or low emission fireworks in

the market, he added *“A sudden ban on anything affects a large number of people who have invested almost lakhs of their money on them. A sudden ban would also encourage illegal hoarding of the fireworks by customers a couple of days right before the ban gets strictly imposed. The need however is not to ban fireworks but to train local artisans like us on how to make green fireworks within the state or switch to making other Diwali products”* (Field 2020).

The industry of firecracker manufacturing in Kolkata is said to be carried out in areas adjoining to the **Nungi market** in the South 24 Parganas of the District followed by another major firework hub in **Champahati**. These two major fireworks manufacturing hubs in the city have emerged over the years as important firework hubs of the state contributing a major portion to Bengal's per capita income as a large portion of the rural workforce are involved in the business of firecracker making in the factors which require little skills. Mr. Tapan Das, a firecracker seller in a large establishment in the Nungi market says *“Most of the raw materials for our firecrackers are transported from Sivakasi in Tamil Nadu and green firecrackers are entirely manufactured in Sivakasi. Hence, Bengal doesn't manufacture green fireworks. I think Bengal should also start manufacturing green firecrackers and train us in the technology and skill of making such fireworks”* (Field, 2020). Adding on the possibility of a present ban in the bursting of fireworks, a firework seller from a medium sized establishment said *“Ban on non -green crackers in 2020 is not possible as 85% of the firecrackers are already manufactured. If the sales of these crackers are stopped then lakhs of people will face severe economic crisis. Already all the GST from the manufacturing company has been paid to the Government.”* (Field, 2020). A recent High court ruled ban (dated 05.11.2020) regarding a citizen's ban on the bursting of firecrackers have therefore put lakhs of these local workforce into worry about how to regain their invested money in the backdrop of an already crumbling state of the economy and a severe health crisis that has gripped the nation.




**FIG 2: Firecracker seller interviewed in Nungi market, South 24 Parganas; Field 2020**

## 6. POLICY AND ACTIONS FOR RESPONSIBLE DIWALI AND SUSTAINABLE LIVELIHOODS

Numerous studies have revealed that an exponential growth in the level of pollutants can be observed every year after the Diwali celebrations throughout the country. The states facing the most distress are the over-populated ones that are heavily industrialized and also have higher AQI resulting from both vehicular and industrial emissions. The emissions from bursting of fire-crackers pose a looming threat over its citizens due to several factors, most of which are preventable. The repeated and city-wide bursting of crackers leads to a formation of a thick layer of smoke that remains in the air owing to the climatic factor during which the festival takes place. The distress caused due to this rise in pollution also affects many already suffering from winter induced ailments like cough and cold, people with pre-existing health conditions and the most to the infants and elderly.

- **Curb in the levels of both noise and air pollution should become a long term regime of celebration and way of life:** The Supreme Court has repeatedly formulated policies and regulations to curb the levels of both air and noise pollution caused right after the festival of Diwali and it's seen that most regulations, if strictly adhered to, show a considerable drop in the pollution curve upon comparison with previous years.
- **Adoption of green firecrackers in place of conventional firecrackers restricted to only certain areas and for a limited period of time:** One very effective policy adopted by the national capital was the strict implementation of the usage of only green crackers during the festival. These resultant emissions caused was seen to be much less toxic to those emitted from regular fire-crackers. If the other states follow lead and adopt similar stringent measures, the rise in post-Diwali pollution could surely be controlled to an extent.
- **Allotment of a specified time slot for bursting of firecrackers for a less concentrated smoke layer :** Another important policy shift that can be advocated largely is the allotment of a specified time slot for bursting of firecrackers in many cities which depicted a far less

- concentrated smoke layer over the cities and the ongoing winds also helped dispersing it timely without turning the cities into a gas-chamber.
- **Individual efforts by citizens:** Apart from these, individual efforts by citizens like abstaining from bursting heavy smoke emanating and loud crackers is the dire necessity for controlling the post-Diwali pollution and keeping the AQI standard below hazardous levels.
  - **Adopting a livelihood centric approach for the people engaged in the firecracker industry and providing them with alternative sustainable livelihood choices :** Last but not the least, a livelihoods centric approach needs to be adopted while drafting public policies on issues of a complete blanket on bursting of firecrackers and use of fireworks on religious occasions and ceremonies as it would put at stake the livelihoods of lakhs of rural artisans involved in this industry. The idea is not to impose a total embargo on the firecracker industry but to advocate policies on the lines of sustainable livelihood generation opportunities and provide alternative livelihood choices for people involved in this business. Some of these initiatives could be promoting handmade traditional *diyas*, lantern and Diwali lights from clay, imparting training on the making of low emission fireworks, engaging them in the production of renewable energy driven lights, lanterns and decorative items etc.
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## 7. CONCLUSION

Diwali is an important cultural celebration in most parts of India. East India continues this tradition with a series of other ceremonies starting from *Kali Puja*, *Chatt Puja* to lavish Indian wedding ceremonies that go on till the end of February. Although, the right to have fun in religious and cultural occasions are not something we can take away from each other, but the need of the hour is to understand that such occasions shouldn't be celebrated at the loss of a clean and pure air that we breathe. Similarly, if we look at the other side of the coin, bringing a complete halt to the firecracker industry by imposing a sudden embargo on the manufacturing and sale of firework products will result in turning lakhs of the rural workforce jobless and helpless in a situation where the nation is already battling a twin challenge of a crumbling economy and a pandemic. Hence, the idea that we wish to advocate through this report is the pressing need to find a middle ground in this issue. Although bringing a complete change in the industry is not possible for the immediate future, what policymakers and decision makers should focus at the moment is to generate alternative livelihood options for a safe, secured and sustainable future for all. Replacing the firecracker industries in the state with production of sustainable Diwali products would not just ensure secure livelihoods for the firecracker sellers but would also serve citizen's purpose in celebrating Diwali with the same cultural vigour but in a more sustainable fashion. Hence, ban on bursting of firecrackers should be adopted in a responsible manner and awareness among the citizens should be the key guiding principle behind any celebrations so that our religious and cultural festivals remain joyous for one and all.

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