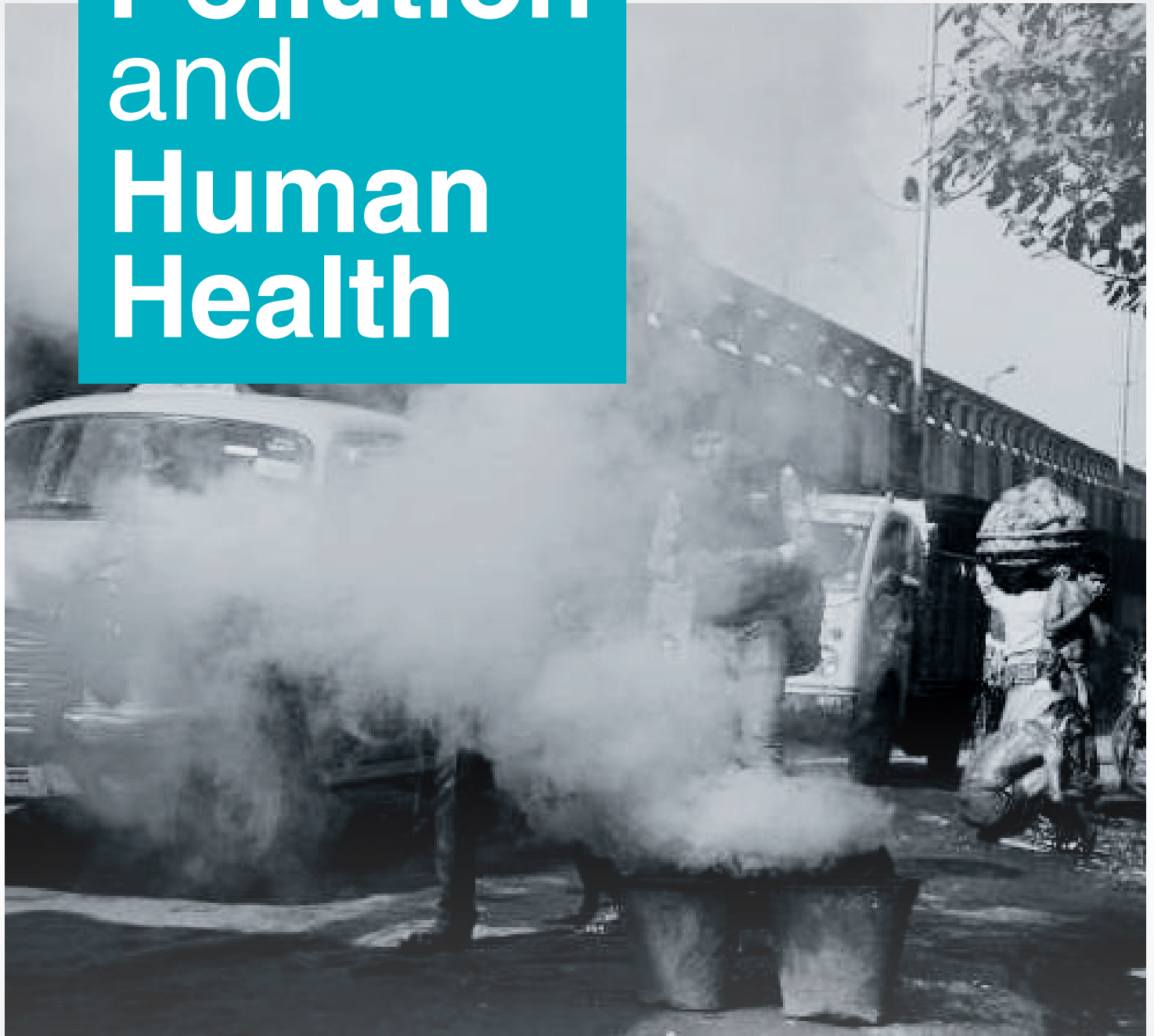


A Study of People's  
Perception of

# Air Pollution and Human Health



## West Bengal

Air pollution has recently received greater attention due to its detrimental effect on human health. The quality of air plays a significant role in the well-being and health of humans. Traffic congestion may increase vehicular emissions that contribute to outdoor air pollution, especially in the urban areas. Traffic-related air pollution is a major contributor to outdoor air pollution in the urban settings, producing significant amounts of carbon dioxide (CO<sub>2</sub>), particulate matter (PM), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) (Zakaria, et. al., 2019).

The continuous data that is collected through the monitoring stations installed by the Central Pollution Control Board have found higher levels of PM<sub>2.5</sub> and PM<sub>10</sub> concentrations in the air of Bengal with the effects of traffic congestion. Biomass burning activities and ultraviolet radiation from sunlight also contributed significantly to high concentrations of PM<sub>10</sub> and ozone particularly from the tropics region.

United States Environmental Protection Act (USEPA) classifies particle pollution mainly into two different sizes based on their predicted penetration capacity into the lung; coarse particulate matter (PM<sub>10</sub>) and fine particulate matter (PM<sub>2.5</sub>).

Coarse particulate matter is a particle with an aerodynamic diameter of 10 μm whereas fine particulate matter with an aerodynamic diameter of 2.5 μm (USEPA 2016). This type of particulate airborne will be deposited into the head region of the airway when inhaled due to its bigger size compared to fine particulate matter which will be deposited further into the tracheobronchial region (Brown, et. al., 2013). The pollutant is generally emitted from vehicle components such as brakes and tires as well as suspension of road dust in urban areas.

**Human perception** plays a fundamental role in people's response to preventive measures (Pantavou, et. al., 2017). People's behaviours and responses to preventive measures depend on the way they perceive environmental stimuli, therefore to protect public health through adaptation measures it is significant to consider people's perception and behavioral changes. The sense of air quality varies among groups and individuals (Zakaria, et. al., 2019). Our study examines traffic-related air quality perception and its effect on human health among active commuters in the state of West Bengal. This study on perception suggests regulation of the transportation system in the state and reducing the risk of adverse health effects.

## OBJECTIVE AND METHODOLOGY OF THE STUDY



The **aim of this study** is to estimate people's opinions on how air pollution is causing a health threat to human life. **Primary data** is used to conduct the study from the common mass, who commute on a regular basis, who buy groceries, drive auto rickshaws, the traffic police, the security guards, and the street vendors. All attempts were made to capture the response from men and women who get exposed to ambient air pollution regularly. The survey was conducted on a total of **2450 respondents from West Bengal by SwitchON Foundation** in the year **2022**. Out of which, **920 respondents** were from the city of **Kolkata**.

### QUESTIONS WERE CANVASSED ON THE FOLLOWING TOPICS

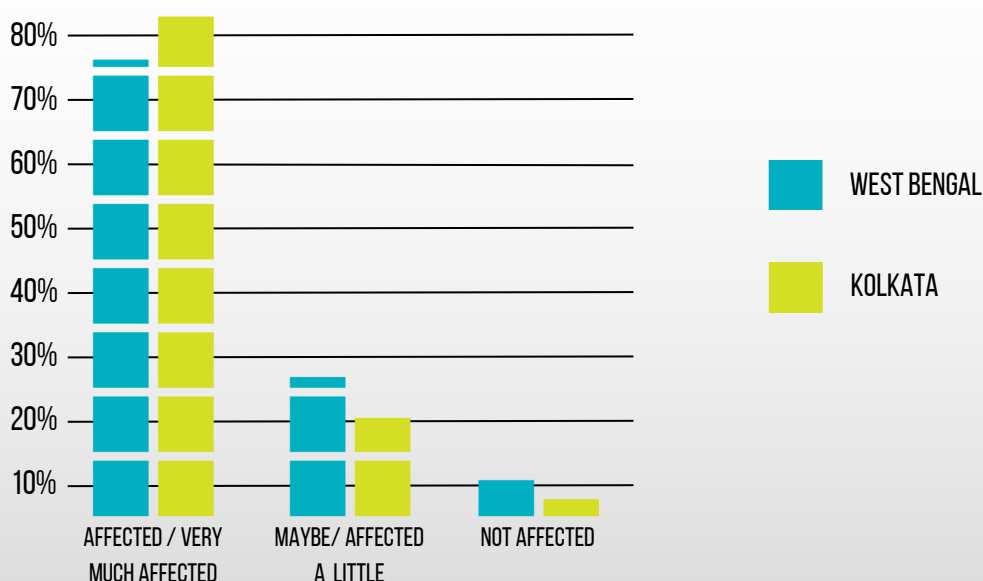
- Do you feel air pollution is causing a problem to you and others around you?
- What factor(s) according to you are the largest factors of air pollution?
- What according to you, the government policymakers and other stakeholders should do to combat the rising air pollution?

## FINDINGS OF THE STUDY

2450 people across the state of West Bengal were asked if they feel that air pollution is causing any threat to their health. The responses were clubbed into 3 categories based on the degree

- Affected/ very much affected,
- Maybe/ affected a little, and
- Not affected

PEOPLE ASSOCIATING AIR POLLUTION WITH HEALTH THREAT



- Almost 80% of the residents of Kolkata said that air pollution is causing a severe threat to human health, in contrast to 72% of respondents across Bengal.
- People living in rural areas and in the coastal belt said human health is affected a little or not much affected due to air pollution, whereas people living in the heart of the city said air pollution is causing serious damage to health.

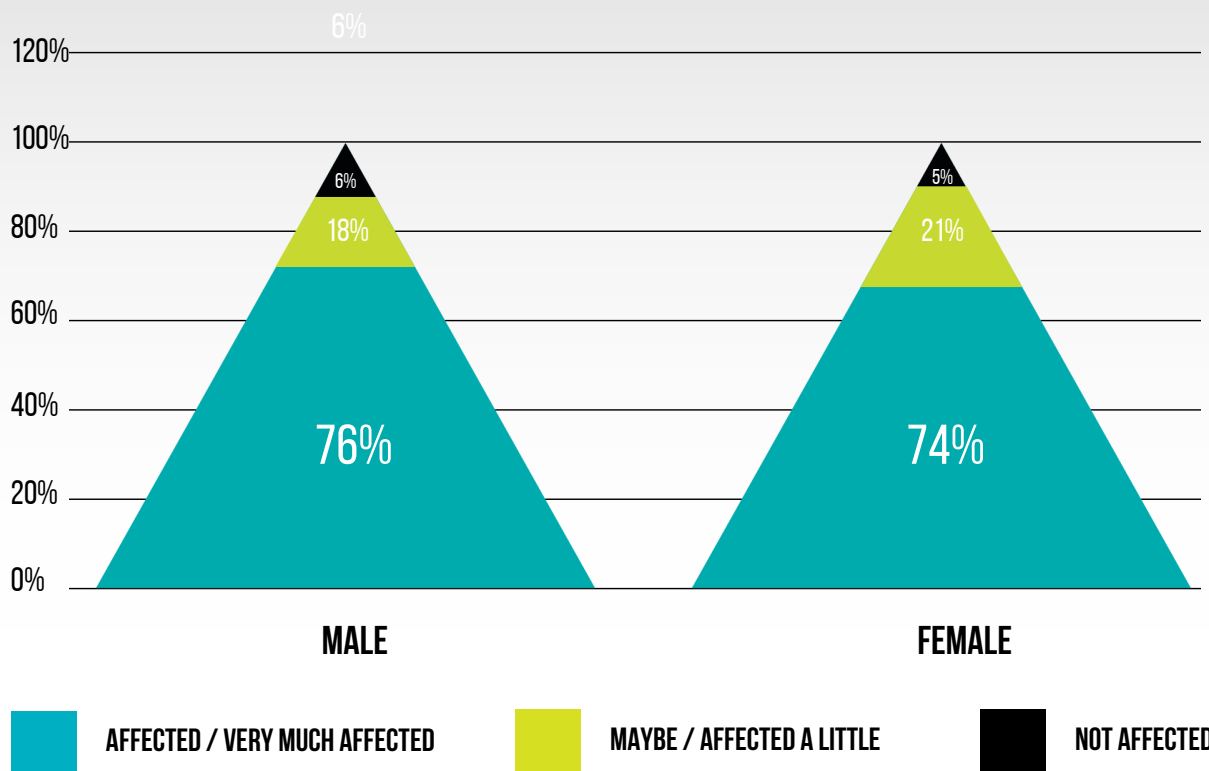
### REASONS OF AIR POLLUTION ( PEOPLE'S PERCEPTION )



During the survey, the respondents were asked to list at least 3 sources of air pollution. The responses are ranked and graphically represented.

- Almost 90% of residents of West Bengal, and 94% of respondents surveyed in the city of Kolkata said vehicular emissions are the major pollution-causing factor, followed by industries and open waste burning.
- 25% of the respondents listed road dust to be a responsible factor of air pollution. Kolkata itself registered a record of 34,000 cars in the year 2022, flagging the fear of pollution in the city.
- The rising number of private vehicles is clearly increasing the pollution level of our country.

## AIR POLLUTION : A THREAT TO HUMAN HEALTHLOOKING THROUGH A GENDERED LENE



- A large majority of people said in the survey that air pollution is causing a threat to human health.
- Separate analysis was done for both male and female respondents, where it is seen that everybody considered air pollution to be a threat, irrespective of their gender.

The respondents were also asked about their expectations from the government and policy-making bodies to control the rising pollution levels. Their statements are listed below-

### EXPECTATIONS FROM GOVERNMENT / POLICYMAKERS AND OTHER STAKEHOLDERS BY THE CITIZENS OF BENGAL



#### • AWARENESS GENERATION

1. Educate the common mass to practice afforestation.
2. Create public awareness about the detrimental effects of air pollution on human health (respiratory health, and lifestyle diseases)
3. Educating children and youth on protecting our environment and teaching them ways to keep it clean and green.
4. Imposition of fines and penalties on citizens for breaching government rules and regulations
5. Providing funds to schools and NGOs by the government to conduct workshops on keeping the environment clean.

**• MOBILITY AND RENEWABLE ENERGY**

1. Active promotion of cycling, walking carpooling, and public transport use over private cars in urban areas and shift to electric cars. Create green spaces in cities to help reduce pollutants.
2. Government should make separate zones for cycling and pedestrians so that people can choose to walk or cycle
3. Incentivize solar cells to make them pocket-friendly
4. Active promotion of renewable sources of energy

**• INDUSTRY AND CONSTRUCTION**

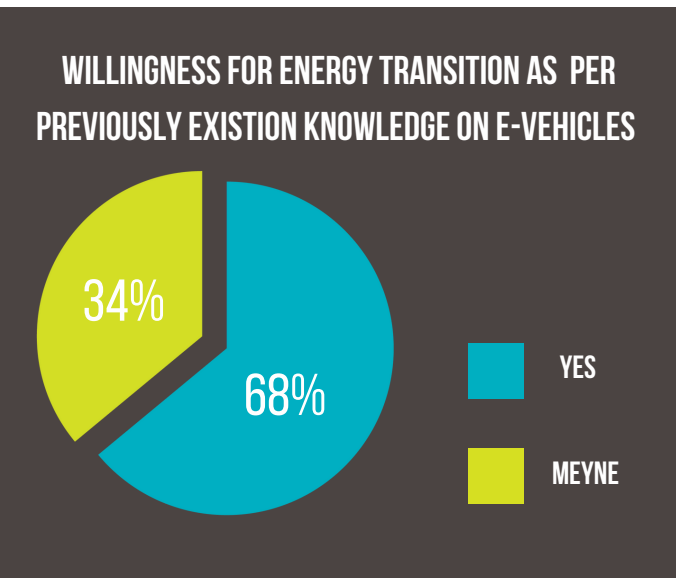
1. Reduction in industrial wastes and air dust
2. Imposition of stringent laws by the government to promote the use of scrubbers and catalytic converters in industries
3. Ensuring that industries obey the pollution control benchmarks

**• WASTE MANAGEMENT**

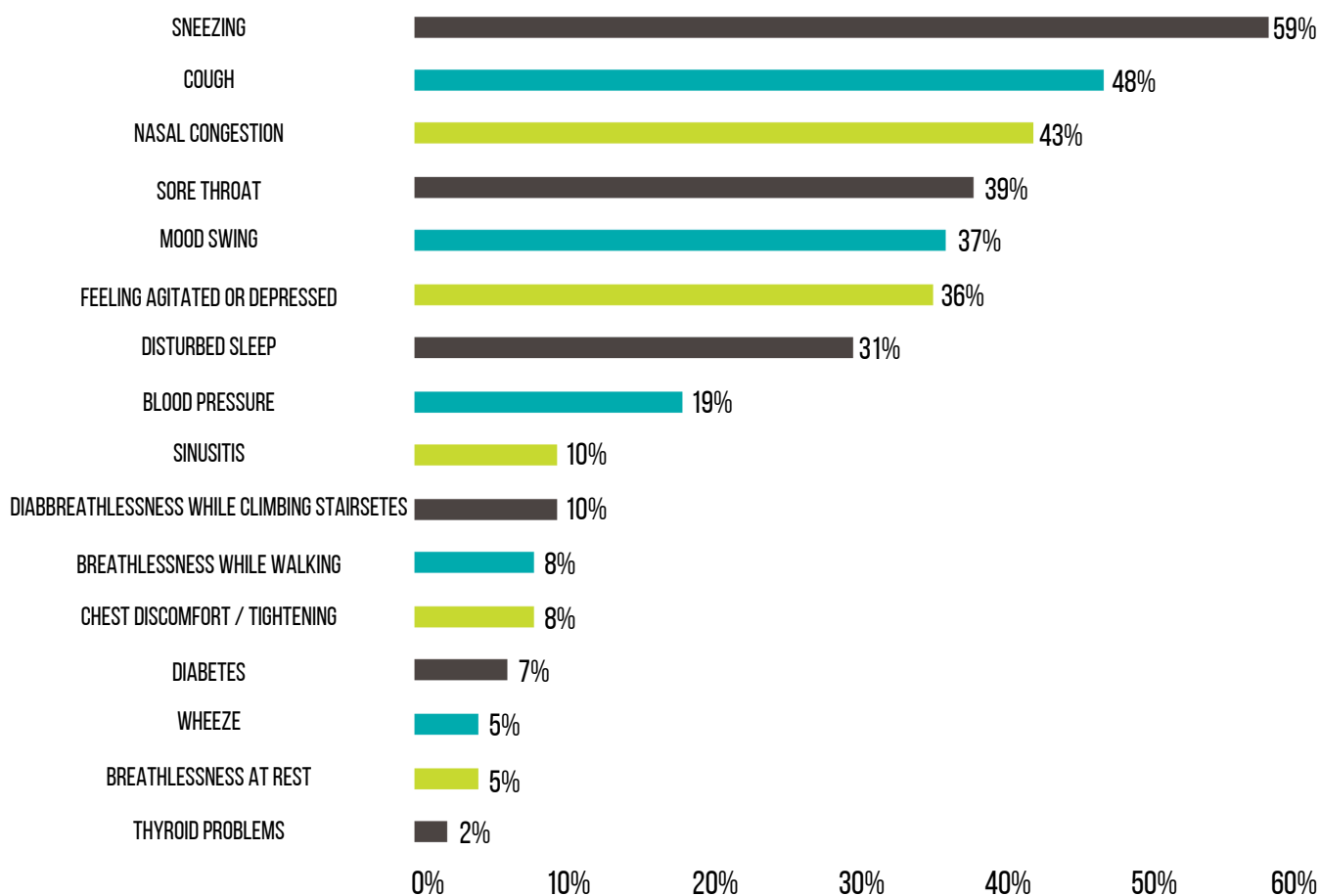
1. Reduction of plastic wastes, particularly single-use plastics
2. Prevention of open burning of coal, fossil fuels, and waste
3. Promote segregation of waste at the household level (proper segregation of medical wastes, vegetable waste, and electronic wastes)

## DISCUSSIONS OF THE STUDY-

The findings of the perception study was correlated with other surveys on major illness and willingness to shift to electric vehicles. In a separate study conducted by SwitchON Foundation on 225 auto drivers driving autos in the streets of Kolkata were asked if they are willing to shift to clean energy, to which 68% of auto drivers have expressed their willingness to shift to electric vehicles, as they understand that their health is getting compromised from breathing polluted air.



## REPORTED HEALTH ISSUES IN KOLKATA



In a health camp conducted by SwitchON Foundation in Kolkata city in 2022, a survey was conducted on 1,250 respondents where people were asked about the major illness that they have, and those health issues are presented in a graphical representation. As visible from the chart, most people suffer from respiratory infections (both higher and lower). The most common symptom reported was sneezing, followed by cough, nasal congestion, and sore throat. It is documented in several literatures that air pollution leads to respiratory illness, and this survey is in alignment to the finding.

### RESPIRATORY ILLNESS AS REPORTED BY THE RESPONDENTS IN THE SURVEY-

- SNEEZING
- COUGH
- NASAL CONGESTION
- SORE THROAT
- WHEEZE
- CHEST DISCOMFORT/TIGHTENING
- BREATHLESSNESS,
- SINUSITIS

Other than respiratory illness, people have also reported psychological and lifestyle diseases. The interesting fact in this survey is when people were asked about the ailments that they associate with air pollution; people did not restrict themselves to just respiratory diseases-

- MOOD SWINGS
- DEPRESSION
- DISTURBED SLEEP
- HYPERTENSION
- DIABETES

## CONCLUSION

Our study has revealed that both males and females across West Bengal have considered air pollution to be a threat to human health. People perceive the rising number of vehicles on the roads to be the primary cause of air pollution. During the surveys, they expressed their opinion of actively promoting cycling, walking, carpooling, and shifting to electric vehicles as measures to control air pollution. The respondents want the government to create walking zones and cycling paths on the roads for active promotion of cycling and walking so that people cycle for livelihood and not for lifestyle. The common mass wants the government to impose fines and penalties on citizens who violate pollution regulating laws, related to vehicles, industries, and waste. People have expressed their views to create awareness among children, youth, and the common mass on environmental protection through workshops and training sessions. Therefore, these strategies should be taken into consideration by the government, non-government organisations, and training schools to advocate and train people on cleaning the environment.



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SwitchON Foundation is a leading, award-winning not-for-profit, established in 2008 with a focus on Environment Sustainability and Equal Opportunities. Presently working in 10 states across India, the organisation spearheads and supports interventions on Clean Energy Access, Sustainable Agriculture, Skilling - Education, and Wellbeing. SwitchON's core competencies lie in testing innovative technologies and business models, communication for advocacy and awareness, capacity building through skilling and training, and implementing / supporting field operations.

