CII-ITC Centre of Excellence for Sustainable Development

VIA
VIDARBHA INDUSTRIES ASSOCIATION

CLEAN AIR ASIA

CII
Confederation of Indian Industry

TOOLKIT FOR MSMEs

NATURE-BASED SOLUTIONS AND CONTROLLING AIR POLLUTION

Copyright © 2022 Confederation of Indian Industry (CII). All rights reserved.

No part of this publication may be reproduced, stored in, or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise), in part or full in any manner whatsoever, or translated into any language, without the prior written permission of the copyright owner. CII has made every effort to ensure the accuracy of the information and material presented in this document. Nonetheless, all information, estimates and opinions contained in this publication are subject to change without notice, and do not constitute professional advice in any manner. Neither CII nor any of its office bearers or analysts or employees accept or assume any responsibility or liability in respect of the information provided herein. However, any discrepancy, error, etc. found in this publication may please be brought to the notice of CII for appropriate correction.

Published by Confederation of Indian Industry (CII), The Mantosh Sondhi Centre; 23, Institutional Area, Lodi Road, New Delhi 110003, India
Tel: +91-11-24629994-7, Fax: +91-11-24626149; Email: info@cii.in; Web: www.cii.in

Table of Contents

About the Toolkit 5

Air Pollution Challenge 6

Air Pollution and its contribution to Climate Change 7

Impacts of Air Pollution 9

Health Impact of Air Pollution 9

Air Pollution and Economic Loss 11

Cities & Air Pollution 12

Challenges of MSMEs 12

Seven Steps to Address Air Pollution by MSMEs 15

Mapping air pollution drivers in MSMEs 15

Awareness creation 17

Technological Solutions 18

Nature-based Solutions (NbS) 20

Partnerships and Collaboration 23

Documenting best practices 27

Conclusion 28

Case Study for Nagpur 31

Reference 33

About the Toolkit

Reducing the environmental impact of MSMEs in both the manufacturing and services sectors is a key success factor in greening the economy. Improving the environmental performance is also a significant business opportunity for MSMEs themselves, as important suppliers of goods and services.

The introductory Toolkit focuses on Micro, Small and Medium Enterprise sector. It covers challenges faced by the MSME sector, steps to address air pollution as well as its financial implications.

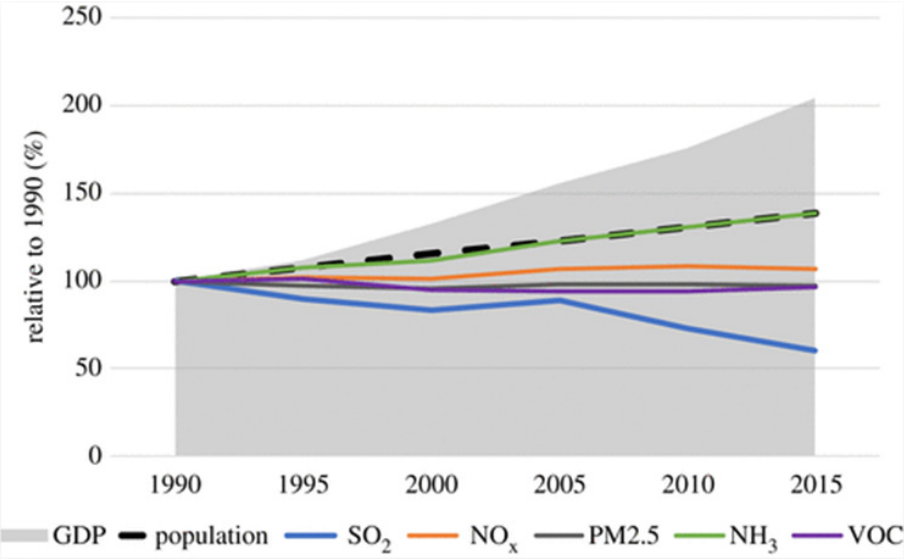
The Government of India introduced initiatives for improvement and betterment of the Micro, Small and Medium Enterprises, and has been constantly encouraging the MSME sector by promoting sustainable practices.

To develop this toolkit, an assessment was undertaken for MSMEs working in the Nagpur City area. The 20 MSMEs covered sectors like Capital goods, Automobile, Paper, Plastic & packaging, Textiles, Chemical & Pharma, Steel Industry and Agri inputs.

This introductory Toolkit has been developed for assisting, supporting, and training officials and executives in the MSME sector. It elucidates the challenges faced by MSME sector, policies available to support and assist them as well as steps to help them improve.

Air Pollution Challenge

Air Pollution has emerged as one of the most critical environmental risk factors for human health, worldwide. Anthropogenic activities are identified as the main drivers of air pollutants and add to pre-existing sources of natural emissions (soil dust, sea salt, vegetation, etc). The drivers of these emissions include population growth and modern lifestyle, industrialisation, transportation, various domestic and industrial combustion processes, crop burning, infrastructure development and other economic activities.[1] The World Health Organization (WHO) estimates that currently about 90% of the people living in cities are exposed to PM2.5 levels above the WHO guideline value of 10μg m-3, and globally between 3 and 9 million cases of premature deaths annually have been attributed to exposure to ambient air pollution[2].



Trends of global GDP, population, and precursor emissions of PM2.5 from anthropogenic sources, 1990-2015 (relative to 1990) Source: Amann et al. 2020.

The Report of the Working Group on Micro, Small and Medium Enterprises (MSMEs) growth for 12th 5-year Plan (2012-17), unveils that the sector accounts for 45% of the manufacturing output and 40% of the total exports of the country. However, majority of the MSME sector is unorganised and utilises crude technologies to increase the

1 Markus Amann, Gregor Kiesewetter, et al. (2020), Reducing global air pollution: the scope for further policy interventions, Royal Society Publishing

2 ibid

production rate. Due to capital constraints and its unorganised nature, the end-to-pipe solutions deployed by these enterprises are limited. It is projected that the MSME sector will contribute to around 70% of the total industrial pollution in India[3].

Further, the Ministry of Micro, Small and Medium Enterprises[4], highlights that the MSMEs accounted for 30.27% of GDP in the year 2018-19. Current economic forecast or survey interprets that with the Indian Economy growing at an average of 7% per annum, it is likely to become a $5 trillion economy by the year 2025. Hence, the development of the MSME sector becomes essential as it is the backbone of India.[5]

Deterioration in air quality due to pollution is a pertinent global problem. Reducing industrial emissions to minimize its environmental & health effects is a major concern in a developing economy like India. According to the source apportionment study conducted by TERI, 2018, industrial combustion contributes to approximately 49% of the entire PM10 emissions in India[6]. Lack of policies to curb pollution, unplanned industrial growth and use of outdated end-of-pipe solutions are some of the crucial causes of industrial pollution. Many industries in India are inadequately equipped with pollution control Measures. There are several Air Pollution Control and Monitoring Technologies available in the market, but it is difficult to make decisions in choosing the most suitable technologies, especially due to an absence of comparative assessments, experts' opinions, and lack of knowledge on the latest efficient technologies.[7] While the government has rolled out stricter norms for certain pollutants for most industrial categories, there is an urgent need to enforce these standards effectively.

Air Pollution and its contribution to Climate Change

Along with the presence of emitted pollutants in ambient air, climate change further impacts air quality. Climate change can impact air quality and, conversely, air quality can impact climate change. Emissions of pollutants into the air can result in changes to the climate. Ozone in the atmosphere warms the climate, while different components of particulate matter (PM) can have either warming or cooling effects on the climate. For example, black carbon, a particulate pollutant from combustion, contributes to warming of the earth, while particulate sulphates cool the earth's atmosphere[8].

3 Kumar, P., Environmental Practices in Small and Medium Size Enterprises in India, 2017

4 Ministry of MSME's. (2017). Annual Report 2016/17. New Delhi: Government of India

5 Annual Report 2020-21, The Ministry of Micro, Small and Medium Enterprise

6 Source Apportionment of PM2.5 & PM10 of Delhi NCR for Identification of Major Sources, Department of Heavy Industry Ministry of Heavy Industries and Public Enterprises, New Delhi, 2018.

7 Air Pollution Control Technologies for MSMEs, National Institute for Small and Medium Enterprise,

8 Air Quality and Climate Research

Air pollution and climate change influence each other through complex interactions in the atmosphere. Increasing levels of GHGs alter the energy balance between the atmosphere and the earth's surface which, in turn, can lead to temperature changes that alter the chemical composition of the atmosphere. Direct emissions of air pollutants (eg. black carbon), or those formed from emissions such as sulfate and ozone, can also influence this energy balance. Thus, climate change and air pollution management have consequences for each other.[9]

Coupled with climate change, air pollution has multi-fold implications of physical, financial, and operational risks at all levels of society, business, and economy. Due to cross-cutting causes like transport, power and industrial emissions, there is an urgency to integrate tackling air quality into the climate change agenda. It is essential to take stock of existing climate change impacts on societies and economies as well as projected impacts that are likely to happen in the future. This includes assessing potential impacts on different actors, as well as an analysis of their options for addressing these. The business sector and individual businesses are, of course, an integral part of this – and in India, MSMEs play a particularly important role.[10]

Climate change impacts, like more frequent and more intense floods are already being felt by Indian MSMEs, even if they are often not recognised as such. The reasons why Indian MSMEs are particularly affected by climate change impacts are manifold, and they are closely connected to general challenges of MSMEs like limited financial resources and access to credit.[11] At the same time, these general challenges to a large part explain why MSMEs, so far, primarily "react" to climate change impacts rather than anticipate and plan for these. Indian MSMEs are known for their ability to swiftly react and modify according to changes in prices and market demand - however, given the magnitude of challenges that lie ahead, this "reactive" approach to climate change adaptation may be too short-sighted[12]. This is truer for MSMEs operating on low technology levels, as they are more severely affected by climate change than businesses with high-technology facilities, and have fewer resources and capacities to face climate change impacts.

The COVID 19 pandemic situation has shown us how anthropogenic activities are major contributors to air pollution. Mitigation of this requires a road map for effective measures and solutions involving all the players- government, businesses, and society equally.[13]

---

9 Air Pollution and Climate Change, Science for Environmental Policy, Special Issue, Issue 24, November 2010,

10 Facing the Impacts of Climate Change: Indian MSMEs and Adaptation, Report by Adelphi supported by GIZ

11 Full Potential Revival and Growth: Charting India's medium-term journey,

12 Innovation readiness of Indian SMEs - Issues and challenges, Federation of Indian Chambers of Commerce and Industry

13 Air Pollution and Climate Change, Science for Environmental Policy, Special Issue, Issue 24, November 2010

Impacts of Air Pollution

"Air (Prevention and Control of Pollution) Act, 1981 defines "Air Pollution" as the presence of air pollutants in the atmosphere[14]. Air pollutants can be defined as any solid, liquid or gaseous substance (including noise) present in the atmosphere in a concentration which may tend to be injurious to human beings, plants, property, environment or other living creatures."

- 1·67 million (95% uncertainty interval 1·42–1·92) deaths were attributable to air pollution in India in 2019, accounting for 17·8% (15·8-19·5) of the total deaths in the country[15]
- 14 Indian cities have been included among the 20 most polluted cities in the world in case of PM2.5 levels, while 13 Indian cities were listed among the most polluted in case of PM10 levels as per World Health Organization (WHO) report, 2016[16]

The association of air pollution with multiple adverse health outcomes is becoming well established, but its negative economic impact is less well appreciated.[17]

Health Impact of Air Pollution

Air Pollution may cause a broad range of health effects depending on the specific pollutant, the method and duration of exposure. People having short term exposure to high levels of industrial air toxins such as nitrogen oxide, sulphur dioxide, carbon monoxide, particulate matter, VOCs, hydrocarbons, lead, ozone may suffer from eye, nose and throat irritation, and difficulty in breathing. Long term exposure to these air toxins may result in cancer and long-term damage to the immune, neurological, reproductive, and respiratory systems. Some toxic air pollutants accumulate in the food chain after getting deposited in soil and surface water and even contribute to ozone and particle pollution with associated environmental and climatic effects.

14 The Air (Prevention and Control of Pollution) Act, 1981,

15 Health and Economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019

16 WHO Global Urban Ambient Air Pollution Database,2016

17 Health and economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019,

There is a list of 187[18] hazardous air pollutants classified by the Environmental Protection Agency, United States of America under the Clean Air Act, which cause serious health issues. India has adopted this list of hazardous pollutants.[19]

Air pollution has various health effects. The health of susceptible and sensitive individuals can be impacted even on low air pollution days. Air pollution risks are typically quantified for ambient particulate matter pollution, household air pollution, and, to a smaller extent, tropospheric ozone. The main sources of ambient particulate matter pollution in India are residential and commercial biomass burning, windblown mineral dust, coal burning for energy generation, industrial emissions, agricultural stubble burning, waste burning, construction activities, brick kilns, transport vehicles, and diesel generators.[20]

Studies from India have shown that short-term and long-term exposure are associated with disease burden and mortality.[21]

Short-term effects are temporary and range from simple discomfort, such as irritation of the eyes, nose, skin, throat, wheezing, coughing and chest tightness, and breathing difficulties, to more serious states, such as asthma, pneumonia, bronchitis, and lung and heart problems. Short-term exposure to air pollution can also cause headaches, nausea, and dizziness.

The long-term effects can cause serious damage to the neurological, reproductive and respiratory systems, and extended-term exposure to toxic air pollutants may also induce a variety of cancers.[22]

Based on the magnitude of public health impact, it is certain that different kinds of interventions should be taken into account. Success and effectiveness in controlling air pollution, specifically at the local level, have been reported. Adequate technological means are applied, considering the source and nature of the emission as well as its impact on health and the environment. The importance of point sources and non-point sources of air pollution control is reported by Schwela and Köth-Jahr.[23]

---

18 Initial List of Hazardous Air Pollutants with Modifications

19 Parivesh: Hazardous Air Pollutants, Central Pollution Control Board,

20 Health and economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019

21 Effects of air pollution on the respiratory health of children: a study in the capital city of India, Shabana Siddique, Manas R. Ray and Twisha Lahiri, Air Quality, Atmosphere and Health, July 2010

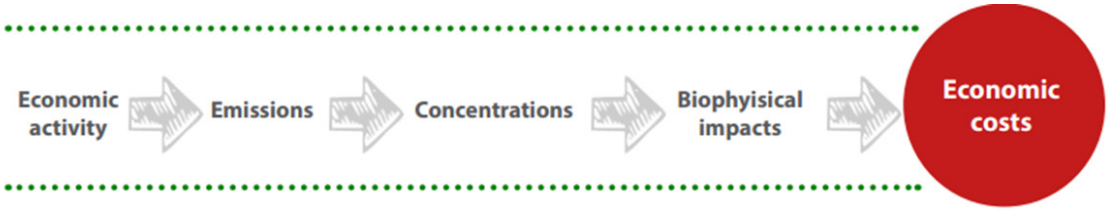
22 Environmental air pollutants and the risk of cancer, Takashi Nakano, Taiichiro Otsuki, November 2013

23 Environmental and Health Impacts of Air Pollution: A Review, Ioannis Manisalidis,Elisavet Stavropoulou, Agathangelos Stavropoulos and Eugenia Bezirtzoglou, Front Public Health, 20th February 2020

Air Pollution and Economic Loss

Businesses have a key role to play in reducing air pollution, since many of their activities cause emissions. They are both contributors and solution-providers; making them essential to lowering pollution, building innovation, and showing governments that fixing air pollution and economic development are not mutually exclusive[24].

Air pollution has huge economic consequences apart from health impacts and also leads to financial implications, including market costs and non-market costs[25]. These include impacts on labour productivity, health expenditures and agricultural yields and are projected to lead to global economic costs, roughly equal to 1% of the GDP by 2060[26].



The economic loss due to lost output from premature deaths and morbidity from air pollution was 1.4% of the GDP in India in 2019, equivalent to INR 260,000 crores (US$ 36.8 billion). The economic loss due to air pollution as a percentage of the state GDP was higher in the northern and central India states, with the highest in Uttar Pradesh (2.2% of GDP) and Bihar (2% of GDP).[27]

- **Impact on labour productivity:** Increase in air pollution levels has resulted in loss of working days related to poor health. This directly impacts the reduction of labour productivity and thus their contribution to gross domestic product (GDP)[28]. Beyond physical health, the negative effects of air pollution may be high for high skilled occupations that form the backbone of the service and information economy[29]
- **Impact on health expenditure:** Negative health impact due to air pollution has increased the capital spent in this sector. Due to the demand shock, it has reduced expenditures in miscellaneous areas or increased the overall expenditure.
- **Agricultural yield:** Air pollutants directly impact crop health by interfering with the growth processes or productivity. Productivity has been hit hard in the zones where pollution levels have risen in recent years.[30]

24 Pollution costs lives and is bad for business. Here are 5 ways companies can clean up the air,

25 The economic consequences of outdoor air pollution – Policy Highlights (OECD's ENV-Linkage Model)

26 The economic consequences of outdoor air pollution – Policy Highlights (OECD's ENV-Linkage Model)

27 Health and Economic Impact of Air Pollution in India, Public Health Foundation of India

28 The economic consequences of outdoor air pollution, OECD 2016

29 Chang, T.Y., Graff Zivin, J., Gross, T. and Neidell, M., 2019. The effect of pollution on worker productivity: evidence from call center workers in China. American Economic Journal: Applied Economics, 11(1), pp.151-72.

30 Chang, T.Y., Graff Zivin, J., Gross, T. and Neidell, M., 2019. The effect of pollution on worker productivity: evidence from call center workers in China. American Economic Journal: Applied Economics, 11(1), pp.151-72.

Cities & Air Pollution

Six of the world's 10 most polluted cities are in India and about 1.25 million people every year are killed in India due to air pollution[31].

As per the study undertaken in 2016[32], the share in PM2.5 emissions are dominated by the industrial (36%) and residential combustion (39%) sectors. Transport contributes to just 4% of PM2.5 emissions at the national scale. However, these emissions are concentrated in the urban centers. Moreover, being ground-based sources, their contribution to prevailing air quality levels could be much higher. Open burning of agricultural residue in rural areas contributes to about 7% of the total PM2.5 emissions. Other sectors cumulatively make up for 11% of these emissions. Power plants contribute 4% of PM2.5 emissions; however, these may contribute significantly to pollution levels in specific zones of influence of the power plants. Current inventories of NOx emissions show dominance of the transport sector (35%), power plants (22%), and DG and agricultural pump sets (15%). SO2 emissions are estimated to be generated mainly by the industry (49%) and power sectors (43%). Hydrocarbon emissions are mainly generated from biomass combustion activities in the residential sector.

Challenges of MSMEs

Micro, Small and Medium Enterprises (MSMEs) play a significant role in the economic growth of the country owing to their contribution to production, exports, and employment. The sector contributes 17 per cent to the country's GDP, 45 per cent to the manufactured output and 40 per cent to the country's exports. It provides employment to 60 million people through 28.5 million enterprises[33].

However, the MSMEs are faced with multiple challenges including technology, finance, lack of skilled manpower, inadequate infrastructure, and environmental issues. The issue of air pollution is a major concern in many parts of India, especially in MSME clusters in the metro cities.

31 6 of the world's 10 most polluted cities are in India,5th March 2020 https://www.weforum.org/agenda/2020/03/6-of-the-world-s-10-most-polluted-cities-are-in-india/

32 Sharma, S., Kumar, A., Datta, A., Mohan, I., Das, S., Mahtta, R., Lakshmi, C. S., Pal, S., Malik, J., (2016). Air pollutant emissions scenario for India. ISBN 978-81-7993-639-9

33 Indian MSME Industry Analysis, 2021.

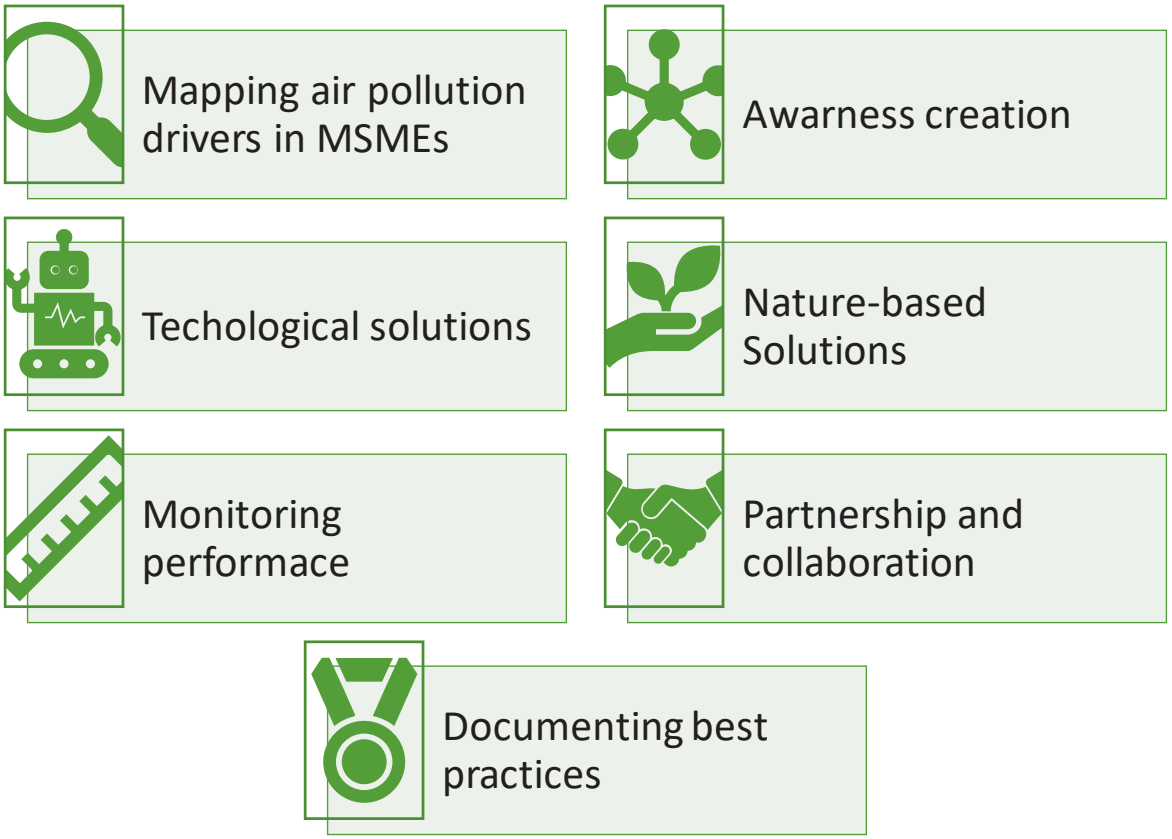
- Lack of awareness & knowledge thus leading to ignorance of negative impacts
- No understanding of inter-linkages of operations and processes with air pollution
- Use of old and outdated technology and physical/financial issues in replacing them
- Lack of access to technology to low-carbon and low-emissions technologies low-carbon and low-emissions
- Shortage of funding for R&D and adopting environmentally-friendly technologies
- Lack of resources including time, human resources, and alternative solutions
- Partnership and institutionalisation challenges to initiate projects/programmes
- Inadequate support and incentives from government and other stakeholders

Table 1: Internal barriers in SMEs that prevent the adoption of environment improvement[34]

UNAVAILIBILITY OF RESOURCES	ATTITUDES AND COMPANY CULTURE	AWARENESS
• Lack of time to investigate issues or locate support or tools • Severe time pressure in small enterprises • Lack of resource allocation to address environmental issues • Lack of investment in training • Cost constraints on investments • No employee allocated the responsibility for environmental issues	• Belief that SMEs have a low environmental impact and have no environmental issues to consider • Mismatch between belief and actions: positive attitude towards the environment is not translated into actions • Perception that environment has no relevance to the business: environment given no status as a business issue • Scepticism about the potential cost savings and market benefits • Prevalence of short-term business planning; belief that costs of environmental measures arise quickly while benefits accrue slowly	• Low awareness of environmental legislation • Low awareness of support organisations and information sources

34 OECD (2015), Environmental Policy Toolkit for Greening SMEs in EU Eastern Partnership countries, EaPGREEN

Seven Steps to Address Air Pollution by MSMEs



Mapping air pollution drivers in MSMEs

Mapping air pollution levels in cities where the MSME is working is a critical first step to recognise the pollution level, and also how the MSME adds to the pollutants with repect to own operations or through the value chain. The value chain covers own operations, transport, and raw material providers (industries and farmers).

Own operations:

Major drivers of pollution in own operations include sources of energy & heat requirements and emissions during the different processes. Energy requirement

for most MSMEs is fulfilled through grid supply and some from solar power. Most MSMEs are heavily dependent on DG sets for meeting the electricity requirements during power cuts.

Coal and biomass are also being used by some industries for meeting the heat and energy requirement in their operations. These may be major pollution drivers in most of the major cities. As a part of pollution load reduction in their businesses, the MSMEs had already started integrating back-filters and adopting new technologies. The adoption of these new technologies needs incentivisation for an early adaptation measure for pollution control.

Promoting biomass usage as energy from nearby areas reduces the transport cost of fossil fuels and emissions. This will substantially reduce coal and other fossil fuel usage and in turn lead to less emissions, thereby resulting in reduction of air pollution. Incentives in the form of providing renewable energy certificates (RECs), tax benefits and priority dispatch based on the proportionate biomass used, will play a critical role

Adoption of solar and renewable energy sources is less in MSMEs, considering the investment cost and total energy requirements for operations. Rooftop solar and collaborative solar power installation will be a solution to increase the use of solar power and reduce grid electricity which is dominated by thermal power plants.

Transport of raw material and finished products:

Transport of raw and finished materials is one of the major drivers of air pollution. MSMEs mostly use trucks for local transportation and railways for national transport. Localising the supply chain and developing a shared transport service platform will support in reducing the overall requirement for transportation thus saving cost for businesses.

Raw material providers (industries and farmers):

MSMEs are dependent on the linked supply chain for raw material as well as the supply of finished products. At present, the mapping of sustainability in the supply chain is not in place for most of the MSMEs, considering the technical and financial resources. This may result in unsustainable practices such as agricultural waste burning, resulting in the emission of higher air pollution.

Suggested questions for mapping Air Pollution risk areas in operations	
Q 1	What is the source of your power input (grid/solar/generator) and how many units are consumed per day?
Q 2	Do you use any boilers in your operations? What is the source of the energy (coal, agri waste, furnace oil, pet coke etc) used in the boiler?
Q 3	Are you meeting emergency power requirements with diesel generators and what is the frequency of use per week/ month?
Q 4	Have you identified any air pollution issues in your operations (dust, fine particles from process, stack emissions etc)?
Q 5	Have you recorded the source of air pollution like burning of waste within your premises or nearby areas?
Q 6	Have you recorded any health issues faced by your employees responsible for absence from duty or lower productivity?
Q 7	How are you transporting raw material and finished products? Are you using shared services as a cost-effective method?
Q 8	Have you implemented actions to reduce air pollution in your operations (energy efficiency, generator modification, sustainable procurement etc)?
Q 9	Are you providing any training to your employees to minimise exposure to air pollution during work?
Q 10	How much total area (percentage) of your unit's or units' premises are covered under plantation?
Q 11	Do you have data of your supply chain, direct and indirect customers on following national guidelines to reduce air pollution?
Q 12	Have you undertaken customers audit/ survey on air pollution or sustainability aspects?

Awareness creation

Air pollution is the leading environmental toxin, attributable to diseases responsible for an estimated 16% of premature deaths globally[35]. The World Health Organization declared air pollution an unequivocal carcinogen with adverse health effects that include asthma attacks, acute and chronic bronchitis, respiratory symptoms, pneumonia,

35 Landrigan, et. al., Pollution and Global Health – An Agenda for Prevention, Environmental Health Perspectives, August 2018

increased risk for acute myocardial infarction, loss of work and school days, as well as premature deaths. Air pollution is a function of complex systems, and solutions to the problem also require multilevel interventions. Awareness creation is an important tool to address the impacts of air pollution on human health. Considering the risks of exposure, MSMEs need to develop communication and awareness plans for employees and local communities along the operations.

Employee Awareness

- Identification of processes emitting air pollutants (DG Operations, Chemical Process, Dust emitting areas, Boilers, etc)
- Providing safety instruments to employees
- Developing site specific visual communication posters for using safety instruments
- Awareness training on avoiding air pollution and operating processes / instruments in a healthy manner
- Regular health check of employees

Local Community Awareness

- Creating awareness on air pollution from industrial operations and other sources
- Avoidance of biomass, plastic and tyre burning during the winter season
- Interactions with the local community on air pollution issues and developing joint plans for addressing it in a collaborative way

Technological Solutions

1. Biomass utilisation to meet energy requirements

Power generators need to be incentivised for burning low sulphur biomass, which is also a renewable source of energy. Incentives may include- Renewable Energy Certificates (RECs), tax benefits and priority dispatch based on the proportionate power generated from co-firing biomass. Existing policy of the Ministry of Power recommends co-firing up to 5-10% biomass in existing coal thermal power units.

Utilizing biomass in boilers offers many economic, social, and environmental benefits such as financial net saving, conservation of fossil fuel resources, creation of job opportunities and CO2 and NOx emissions reduction. Considering the agriculture practices in India, the availability of agri waste in the industrial areas will ensure a sustainable supply of biomass for the operations.

Bio-CNG production from biomass residue in an agrarian state to meet the future energy demands seems to be a viable alternative. This will help in managing biomass residue without harming the environment besides producing organic manure for crops. During the production of Bio-CNG, Bio manure is produced as a by-product which is a crucial part of the entire system. It not only impacts the air pollution scenario but also helps in reducing usage of chemical inputs in the farms[36].

Solutions for utilising agricultural residue in the construction sector are fast emerging and are driven by demand for affordable housing and natural building materials with low embodied energy. Greenjams and Strawcture are two such start-ups working in the construction application by converting rice straw into agrocrete bricks/blocks and strawboard panels. As rice straw is converted into construction materials, its application becomes carbon neutral or carbon negative depending on its actual use[36].

Biomass residue can be utilised by converting it into pulp which can be further used for production of multiple products such as paperboards for packaging, disposable tableware etc. It not only addresses the air pollution problem but can act as an alternative solution to plastic pollution[36].

2. Solar power adaptation

The MSME sector has a crucial role to play in reducing greenhouse gas emissions and contributing to the country's clean energy goals. However, the adoption and growth of rooftop solar applications in the MSME sector in India is yet to pick up. The government of India is targeting to achieve a capacity of 40 GW rooftop solar by 2022. Achieving the 40 GW target will require bringing segments such as MSMEs and residential consumers to the forefront.

3. Avoidance

a. Chakr Innovation[37] has developed a retrofit emission control device for diesel generators. It captures ~90% of particulate matter emissions from the exhaust air without reducing energy efficiency. The diesel soot captured from the exhaust is converted into inks and paints.

b. Limited vehicular movement and introducing cycle zones and no heavy vehicle zones[38]

36 Actionable solutions for waste-to-wealth from crop residue, Mohit Sharma, Aditya Bhuyan, Ishan Sahajpal, 20 january 2020

37 Chakr Innovation – Revolution through pollution

38 National Clean Air Programme (NCAP) for Indian Cities: review and outlook of clean air action plans, Tanshuree Ganguly, Kurinji L. Selvaraj, Sarath K. Guttikunda, Atmospheric Environment: X, Volume 8, December 2020

Nature-based Solutions (NbS)

Nature-based Solutions (NbS)[39] is a novel concept, defined as actions inspired by, supported by, or derived from nature that deploy various natural features and processes in a resource efficient and sustainable manner. They are adapted to local systems into diverse spatial scales, redefining the role of nature in urban, rural, and natural environments and face social, environmental, and economic challenges, leading to multiple benefits and supporting sustainable development and resilience.

NbS promises to be a cost-effective, and easily adoptable approach for mitigating air pollution. The emission and pollutants, including increasing carbon emission can be controlled through solutions like:

1. **Reforestation**

   Reforestation is the most significant NbS, which supports in mitigating the pollution load and maintaining clean air quality. The forest area and plantation in and around cities is already effective in management of a significant portion of air pollution and sequestrating carbon. Restoring degraded land cover and native ecosystems/habitats in possible spaces within own operations and nearby areas will help in further removal of pollutants like SO2, PM10, PM2.5, and NO2 by an average of 27% through interception of particulate matter and absorption of gaseous pollutants. This requires collaboration with local authorities and the community to

   - Identify the native species that will help in improving air quality by pollutant absorption
   - Map the type of ecosystem, components of ecosystem (local flora, fauna, water bodies, soil quality) and designing a suitable restoration plan including all components
   - Timely monitoring of trends in the changing ecosystem and ecosystem services and avoiding or mitigating the drivers of negative impact
   - Encourage nursery development for rejuvenation of key or critically valuable plant species at the local level

2. **Greenbelt Development**

   The greenbelt acts as a natural air filtration and purification system. For achieving clean ecosystem services like clean air, clean ground water and habitat for local fauna, greenbelts have been playing a very vital role. The use of mixed

39 Nature- Based Solutions Handbook, ThinkNature, Giorgos Somarakis, Stavros Stagakis, Nektarios Chrysoulakis, 2019

gradient design in plantation and greenbelt development will support establishing a natural ecosystem that aids in the healthy functioning of ecosystem services and biodiversity.

- Maintenance of 33% or as per CPCB standards of greenbelt or green cover in own operations
- Implementing mixed-gradient plantation including herbs, shrubs, and trees
- Use of native species, especially those supporting filtration of particulate matter and other emissions
- Developing biodiversity parks within operational areas that act as ambient air zones and moderate the pollution levels
- Developing green corridors adjacent to roads to lower dust and other emissions

3. Natural Sink for Pollutant Control

Natural soils are natural absorbents of pollutants and support filtration and fixation of various pollutants including carbon. Maintaining soil health and monitoring agricultural practices play a very crucial role in enabling clean air. This requires action plans for integration of sustainable practices like:

- Avoiding disturbance of topsoil in areas of active operations, through runoff and construction
- Building capacity of internal stakeholders on ways of handling operations and avoiding contamination of soil in green spaces, plantation areas and buffer zones
- Promoting awareness on sustainable practices at the farm level to minimise use of chemical fertilisers or pesticides
- Supporting farmers to adopt solutions to minimise or avoid tillage and prevent crop burning
- Engaging the local community and stakeholders in plantation drives to improve the green cover in surrounding areas that will help in strengthing the soil quality

4. Clean Air Zones or Buffer Zones

- Demarcating “no operation zones” to avoid emissions especially due to transportation
- Developing green spaces with mixed gradient plantation at high activity areas, cross-junctions, and in residential areas
- Developing a biome park by including variety of plants, birds’ nests, species supporting pollinators, and water fountains in collaboration with suitable

partners. This can be used as a knowledge centre for employees, youth and local communities and will act as a natural fresh air rich region

5. Biodiversity Conservation and Ecosystem Protection

- Create awareness at the stakeholder level on conservation and sustainable management of forests, natural habitats, wetlands, and farming land
- Enhance the ecosystem surrounding wetlands and agricultural land by incorporating plantation of key species along the boundary
- Establish collaborations and take up initiatives and programmes for ecosystem restoration of forests, wetlands and water reserviors in the vicinity of operational sites and supply chain intervention areas
- Take up studies on mapping and assessment of biodiversity, impacts due to operations and other activities and the associated risks

6. Tools & Metrics for Integration of NbS and Controlling Air Pollution

- Self-assessment at regular intervals of impacts due to own operations and operations the supply chain level

- Annual assessments at the community level covering areas of unsustainable practices, key impacts and associated risks
- Screening for emissions at all levels of operations, community and cluster
- Annual cluster-level assessment of mangement and performance towards air pollution and other environmental impacts and mitigation processes
- Monitoring of green spaces to assess the flora and fauna and identify invasive species
- Establishing a system for regular checks of ambient level of air at the operations and community level

Partnerships and Collaboration

CENTRAL GOVERNMENT INITITATIVES

Government of India has been taking various steps to promote and assist the MSME sector. In 2018, the Government launched 12 key initiatives[40] for outreach and support of the MSME sector under four main heads, which would help in the growth, expansion, and facilitation of MSMEs across the country.

1. **Access to Credit**
   - Launch of the 59-minute loan portal to enable easy access to credit for MSMEs
   - 2 percent interest subvention for all GST registered MSMEs, on fresh or incremental loans
   - All companies with a turnover of more than Rs. 500 crores, must now compulsorily be brought on the Trade Receivables e-Discounting System (TReDS)

2. **Access to Markets**
   - Public sector companies have been asked to compulsorily procure 25%, instead of 20% of their total purchases, from MSMEs
   - Out of 25% procurement mandated from MSMEs, 3% must now be reserved for women entrepreneurs
   - All Public sector undertakings of the Union Government must now compulsorily be a part of Government e-Marketplace (GeM)

40 PM Launches Historic Support and Outreach Initiative for MSME sector, 2nd November 2018, GS Times http://www.gstimes.in/gstime/economy-pm-unveils-12-key-initiatives-for-msme-sector/

3. Technology Upgradation

- 20 hubs and 100 spokes in the form of tool rooms to be established across the country to facilitate product design

4. Ease of Doing Business

- Clusters of pharma MSMEs will be formed and 70% cost of establishing these clusters will be borne by the Union Government
- To simplify government procedures, the returns under 8 labour laws and 10 Union regulations must now be filed only once a year
- The establishments to be visited by an inspector, will be decided through a computerised random allotment
- Environmental clearances under the air pollution and water pollution laws, have been merged into one. Also, the return will be accepted through self-certification
- In case of minor violations under the Companies Act, the entrepreneur will no longer have to approach the Courts, but can correct them through simple procedures.

Apart from the above initiatives, the following initiatives have been in existence to promote the MSME sector:

1. Udyog Aadhar Memorandum: a simple one-page registration form to promote ease of doing business for MSMEs in India.
2. A Scheme for Promoting Innovation, Rural Industry and Entrepreneurship (ASPIRE): The scheme promotes innovation and rural entrepreneurship through rural Livelihood Business Incubator (LBI), Technology Business Incubator (TBI) and Fund for Funds for start-up creation in the agro-based industry.
3. Credit Guarantee Fund Scheme: To facilitate easy flow of credit, guarantee cover is provided for collateral free credit extended to MSMEs.
4. Prime Minister's Employment Generation Programme (PMEGP): This is a credit linked subsidy scheme, for setting up of new micro-enterprises and to generate employment opportunities in rural as well as urban areas of the country.
5. Scheme of Fund of Regeneration of Traditional Industries (SFURTI): This scheme aims to make traditional industries more productive and competitive by organising traditional industries and artisans into clusters.

6. Credit Linked Capital Subsidy Scheme (CLCSS) for Technology Upgradation: CLCSS aims at facilitating technology upgradation of Micro and Small Enterprises by providing 15% capital subsidy for the purchase of plant and machinery.

Though the initiatives are mainly credit related there are also initiatives for technological innovations/ upgradation and ease of doing business, which can help in promotion of sustainable practices in the MSME sector.

STATE GOVERNMENT INITITATIVES

Developing a Star Rating Program for MSMEs

The Maharashtra Star Rating Program[41] is a transparency initiative by the Maharashtra Pollution Control Board (MPCB). The program discloses information on industrial particulate matter air pollution in an understandable manner. The least polluting industries are rated 5-stars and the most polluting industries are rated 1-star.

Under this program, MPCB is focusing on industries with a turnover of INR 25 crores and cover 10 major sectors (Cement, Chemical, Metal work, Paper, Pharmaceutical, Power, Sugar & Distilleries, Textile, Food processing, Glass & Ceramic and Bio-medical Waste Incinerators). At present the program only covers 5% of total industries and intends to create a precedent for industry-led collaborative action for a comprehensive remedial action.

These ratings give a basis for MPCB to issue notices to industries with 1- and 2-star ratings for corrective actions needed. The rating system can be adopted for MSMEs and based on the rating, banks can support MSMEs in extending loans and financial support for investing in pollution control equipment.

Partnerships with the local community for afforestation

Local communities along the projects are highly exposed to air pollution due to industrial operations. Biomass, plastic, and vehicle tyre burning by labour, in the local community is also frequent in Industrial areas leading to increase the pollution load. Businesses must work on engagement with local communities to create awareness on air pollution and avoidance of biomass, plastic and vehicle tyre burning. A community level partnership can be established for undertaking plantation activities, protection of existing plants.

Plantation of trees in the local community provide a multitude of benefits, both long and short term. In addition to being attractive aesthetically, they remove and store

41 https://mpcb.info/about-program/

carbon from the atmosphere, slow down heavy rains reducing the risk of flooding, enhance air quality, and improve the urban heat island effect by reflecting sunlight and providing shade. Also, the physical weight of a tree consists of approximately 50% carbon, and such trees have a strong climate change mitigation effect when in high enough numbers. Some of the benefits such as mitigation of the urban heat island effect and improvements to air quality are localised and bring the most benefits to the people who live in the local area. Others such as the removal of carbon from the atmosphere will benefit the wider population, not just those who live the most locally.

Ease of doing business for MSMEs: SIDBI[42]

Small Industries Development Bank of India (SIDBI) — the principal financial institution focusing on Micro, Small and Medium Enterprises (MSMEs) in the country have deployed a 'Project Management Unit' (PMU) in the north-eastern state of Assam to develop the local MSME ecosystem. The decision was taken as part of a Memorandum of Understanding (MoU) signed between SIDBI and the Assam government in December 2020. The PMU will support the state government in making necessary interventions to boost the competency of MSMEs in Assam. The partnership with Assam is a part of SIDBI's initiative to set-up such PMUs in 11 states including Gujarat, Odisha, Maharashtra, Tamil Nadu, New Delhi, Haryana, Rajasthan, Uttar Pradesh, Uttarakhand, Andhra Pradesh, and Karnataka to strengthen MSMEs in the respective states.

While their regulatory compliances have been less than desirable in the past, there have been considerable efforts to mainstream MSME compliances through various initiatives led by Central and State Governments; banks and FIs. The efforts in the recent past to improve regulatory compliances and environmental management at MSMEs[43] include:

- Sensitization of MSMEs about environmental impacts of industries including public health and safety issues
- Awareness building on environmental regulatory obligations, and compliance requirements
- Labour laws and environment, health and safety aspects and the importance in MSME operations

42 Financial Express (2020) SIDBI's state-wise MSME programme now partners with Assam to offer these benefits to small businesses

43 World Bank (2020), Environmental and Social Systems Assessment (ESSA): Raising and Accelerating MSME Productivity (RAMP), Draft Consultations

- Potential and feasibility of Combined Effluent Treatment Plants (CETPs) facilities to address economies of scale
- Adoption of cleaner production methods including integration of energy efficiency and lean manufacturing processes and
- Integration of environmental management aspects into credit risk management by the banks and FIs.

Documenting best practices

- Integrating air quality monitoring and management into environment management systems
- Establishing emission inventory for key pollutants from own operations and suppliers
- Adopting a clean air policy at the operations level and making regular performances towards maintaining ambient air quality in and around the operational site
- Including the clean air policy in suppliers' code, material procurement policy and employees' code of conduct
- Integrating aspects of air quality in Corporate Social Responsibility programmes and other community level programmes
- Capacity building and support for enterprises may also cover activities such as development and dissemination of methodological materials and case studies, as well as the implementation of training programmes. Key success factors of capacity building activities include:
  - Involving multiple public sector organisations and industry associations in programme design, implementation, and strategic oversight.
  - Affordability of support services, which have a major influence on their uptake by SMEs;
  - Consideration of economic impacts of green practices (on companies' profitability, employment, competitiveness, etc.)
  - Promoting the programme's achievements, including through publicising successes as case studies.
  - Using local delivery partners to enable capacity building programmes to gain local knowledge, credibility, and accountability; and
  - Regular, independent, and impartial evaluation

Conclusion

This Introductory Toolkit focuses on solutions that are available to the MSME sector. It will assist the MSME sector to know and understand options available to make them more sustainable and use mitigative measures for combating air pollution.

The government's environmental outreach to MSMEs includes compliance promotion and larger efforts to encourage green business practices. The rapid expansion of web-based guidance, an undoubtedly modern and cost-effective communication tool, does not yet dominate the preferences of SMEs: only a minority of small businesses has rated the internet as their favourite way of receiving environmental information. While in the long-term web-based guidance is likely to become the primary source of support for MSMEs, in the short and medium-term, online tools need to be complemented by other, more traditional instruments such as paper and electronic mailings, brochures and workshops. Government bodies, including ministries of economy and environment, should work in partnership with trade associations and business support organisations to elaborate and disseminate environmental guidance, which would add to its credibility.

Annexure I

Findings of the survey undertaken for mapping air pollution risks in operations across MSME sector when surveys were done on the following parameters.

MSMEs Companies Assessed

Automobile	Capital Goods	Paper, Plastic and Packaging	Chemicals & Pharmaceutical	Textile	Steel

Figure A2: The plots showing percentage power source, percentage usage of boilers in different set of industries, emergency power requirement of other industries, and measures to control air pollutions.

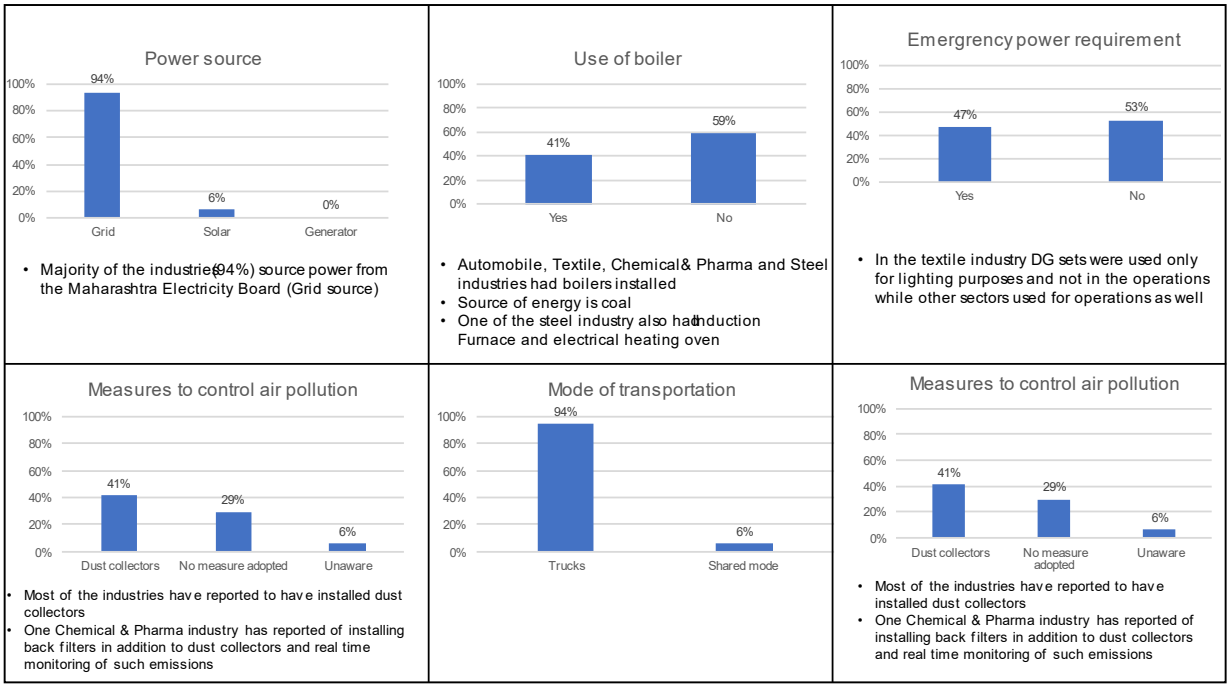
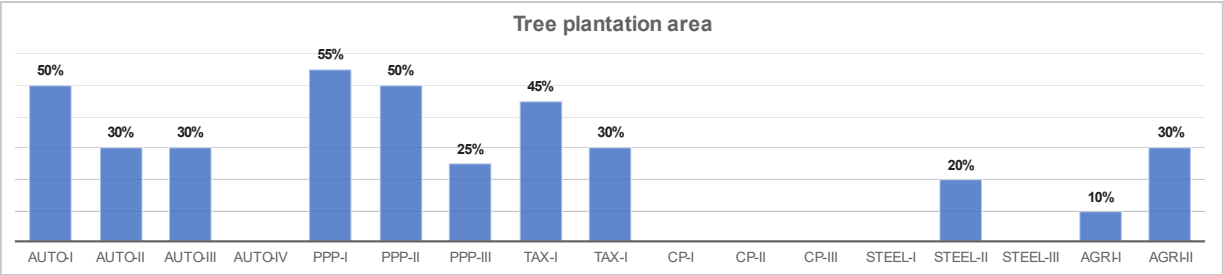


Figure A2: Survey of green coverage in industrial area



- *Auto I, II, III IV- Four industries from Automobile sector surveyed*
- *PPP I, II, III Three industries from Paper, Plastics and Packaging sector surveyed*
- *TAX I, II- Two industries from Textile sector surveyed*
- *CP I, II, III Three industries from Chemical and Pharmaceuticals sector surveyed*
- *STEEL I, II, III Three industries from Steel sector surveyed*
- *AGRI I, II- Two industries from Agricultural inputs (nutrients etc) sector surveyed*

- Most of the industries have reported of green cover for approx. 30% of the plant area
- Only the chemical & Pharma industries didn't respond to green cover in a positive note

Other remarks

- Only one industry (Truform Techno Products Ltd.) is found to be training their employees to minimise exposure to air pollution during work
- SHALIMAR NUTAIENTS PRIVATE LIMITED (Agri inputs) is required by its customer to meet the guidelines of air pollution
- None of the company have taken any kind of survey activity to access the air pollution scenario of their activities

Annexure II

Case Study for Nagpur

Six of the world's 10 most polluted cities are in India and about 1.25 million people every year are killed in India due to air pollution[44].

Nagpur is the geographical centre of the Indian peninsula and is the 3rd largest city, a major commercial and political hub of the state of Maharashtra. Though agriculture, especially-oranges and ayurvedic medicine, is a large share of the economy, because of its location closeness to the coal belt, important sectors include power & thermal energy, manufacturing like cement and a large group of MSMEs. The district has been called one of the future global cities of the world, due to its increasing economic development, rapid urbanization, high industrialization, and fast-growing technology sector.

Drivers of Air Pollution in Nagpur

Air pollutants in Nagpur has short-term, seasonal, and long-term variations. Atmospheric conditions determine the fate of air pollutants after their release into the atmosphere. The mean transport wind velocity, turbulence and mass diffusion are the three important and dominant mechanisms in the air pollutant dispersal.[45]

During the summer months, the average mixing height is typically at its greatest, resulting in increased mixing through a greater volume of the troposphere, and hence lower pollutant concentrations. The monsoons result in a large amount of precipitation, high wind velocities and changes in general wind direction. The large amounts of precipitation reduce atmospheric pollution via associated wet deposition processes. Further, higher wind velocities allow for pollutant transport away from sources, increase mixing processes and winds coming from the environment have less background concentrations than that of continental air masses.

Wind-blown PM10 and PM2.5 from a city's air-shed and long-range inter-state or intercountry transfer is also a contributor to air pollution in Nagpur. Though it may

44 6 of the world's 10 most polluted cities are in India,5th March 2020 https://www.weforum.org/agenda/2020/03/6-of-the-world-s-10-most-polluted-cities-are-in-india/

45 Contribution And Variation of Air Pollutants In Industrial Area Of Nagpur, India, Amruta Anjikar, Vishal Soni, Parvin Meshram and Animesh Kumar Garg, January 2015

vary with season and location of the city, it can account for a significant share in some locations. Thermal power and industries located along the Nagpur air sheds in Koradi, Khaparkheda, Butibori, Mauda, and Hingna are one of the major contributors of air pollution in Nagpur

Nagpur district has five thermal power plants in the state of Maharashtra with over 7000MW installed capacity[46]

Nagpur's 2019 average of 47.2 µg/m^3 puts it in the position of 146th most polluted city worldwide, and 50th most polluted in India

Toxic forms of PM2.5 and PM10 are released into the atmosphere by a combination of activities, raising Nagpur's ambient pollution levels on a yearly basis. The contributing factors vary from vehicular emissions, construction site activities, as well as industrial pollution and smoke sources arising from domestic activities such as stove cooking with woods and other organic materials being burnt. The myriad forms of pollution leading to deterioration of air quality include nitrogen dioxide (NO2) being the most prominent, seen mainly in vehicular emissions, as well as being released from any other activities in which combustion takes place. Others would include sulphur dioxide (SO2), carbon monoxide (CO) and ozone (O3), as well as black carbon and volatile organic compounds (VOC's) coming from the combustion of fossil fuels and organic matter[47].

46 Unknow Hurdles to a Trillion Dollar Economy: Solving Air Pollution in Maharashtra, Climate Trends, August 2019

47 Air Quality in Nagpur, IQAIR

Reference

Markus Amann, Gregor Kiesewetter, et al. (2020), Reducing global air pollution: the scope for further policy interventions, Royal Society Publishing

Kumar, P., Environmental Practices in Small and Medium Size Enterprises in India, 2017

Ministry of MSME's. (2017). Annual Report 2016/17. New Delhi: Government of India.Annual Report 2020-21, The Ministry of Micro, Small and Medium Enterprise.

Source Apportionment of PM2.5 & PM10 of Delhi NCR for Identification of Major Sources, Department of Heavy Industry Ministry of Heavy Industries and Public Enterprises, New Delhi, 2018.

Air Pollution Control Technologies for MSMEs, National Institute for Small and Medium Enterprise,

Air Quality and Climate Research

Air Pollution and Climate Change, Science for Environmental Policy, Special Issue, Issue 24, November 2010,

Facing the Impacts of Climate Change: Indian MSMEs and Adaptation, Report by Adelphi supported by GIZ

Full Potential Revival and Growth: Charting India's medium-term journey,

Innovation readiness of Indian SMEs - Issues and challenges, Federation of Indian Chambers of Commerce and Industry

Air Pollution and Climate Change, Science for Environmental Policy, Special Issue, Issue 24, November 2010,

The Air (Prevention and Control of Pollution) Act, 1981,

Health and Economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019

WHO Global Urban Ambient Air Pollution Database,2016

Health and economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019,

Initial List of Hazardous Air Pollutants with Modifications

Parivesh: Hazardous Air Pollutants, Central Pollution Control Board,

Health and economic impact of air pollution in the states of India: The Global Burden of Disease Study 2019

Effects of air pollution on the respiratory health of children: a study in the capital city of India, Shabana Siddique, Manas R. Ray and Twisha Lahiri, Air Quality, Atmosphere and Health, July 2010

Environmental air pollutants and the risk of cancer, Takashi Nakano , Taiichiro Otsuki, November 2013

Environmental and Health Impacts of Air Pollution: A Review, Ioannis Manisalidis,Elisavet Stavropoulou, Agathangelos Stavropoulos and Eugenia Bezirtzoglou, Front Public Health, 20th February 2020

Pollution costs lives and is bad for business. Here are 5 ways companies can clean up the air,

The economic consequences of outdoor air pollution – Policy Highlights (OECD's ENV-Linkage Model)

Health and Economic Impact of Air Pollution in India, Public Health Foundation of India

The economic consequences of outdoor air pollution, OECD 2016

Chang, T.Y., Graff Zivin, J., Gross, T. and Neidell, M., 2019. The effect of pollution on worker productivity: evidence from call center workers in China. American Economic Journal: Applied Economics, 11(1), pp.151-72.

6 of the world's 10 most polluted cities are in India,5th March 2020 https://www.weforum.org/agenda/2020/03/6-of-the-world-s-10-most-polluted-cities-are-in-india/

Sharma, S., Kumar, A., Datta, A., Mohan, I., Das, S., Mahtta, R., Lakshmi, C. S., Pal, S., Malik, J., (2016). Air pollutant emissions scenario for India. ISBN 978-81-7993-639-9

Indian MSME Industry Analysis, 2021.

OECD (2015), Environmental Policy Toolkit for Greening SMEs in EU Eastern Partnership countries, EaPGREEN

Landrigan, et. al., Pollution and Global Health – An Agenda for Prevention, Environmental Health Perspectives, August 2018

Actionable solutions for waste-to-wealth from crop residue, Mohit Sharma, Aditya Bhuyan, Ishan Sahajpal, 20 january 2020

Chakr Innovation – Revolution through pollution

National Clean Air Programme (NCAP) for Indian Cities: review and outlook of clean air action plans, Tanshuree Ganguly, Kurinji L. Selvaraj, Sarath K. Guttikunda, Atmospheric Environment: X, Volume 8, December 2020

Nature- Based Solutions Handbook, ThinkNature, Giorgos Somarakis, Stavros Stagakis, Nektarios Chrysoulakis, 2019

PM Launches Historic Support and Outreach Initiative for MSME sector, 2nd November 2018, GS Times

http://www.gstimes.in/gstime/economy-pm-unveils-12-key-initiatives-for-msme-sector/

Star Program,https://mpcb.info/about-program/

World Bank (2020), Environmental and Social Systems Assessment (ESSA): Raising and Accelerating MSME Productivity (RAMP), Draft Consultations.

https://mpcb.info/about-program/

Financial Express (2020) SIDBI's state-wise MSME programme now partners with Assam to offer these benefits to small businesses

6 of the world's 10 most polluted cities are in India,5th March 2020 https://www.weforum.org/agenda/2020/03/6-of-the-world-s-10-most-polluted-cities-are-in-india/

Contribution And Variation of Air Pollutants In Industrial Area Of Nagpur, India, Amruta Anjikar, Vishal Soni, Parvin Meshram and Animesh Kumar Garg, January 2015

Unknow Hurdles to a Trillion Dollar Economy: Solving Air Pollution in Maharashtra, Climate Trends, August 2019

Air Quality in Nagpur, IQAIR

Clean Air Asia was established in 2001 by the Asian Development Bank, the World Bank, and USAID. Today, we are registered as an international nongovernmental organization that leads the regional mission for better air quality and healthier, more livable cities in Asia. We aim to reduce air pollution and greenhouse gas emissions in 1000+ cities in Asia through policies and programs that cover air quality, transport, industrial emissions, and energy use. We work with ministries (energy, urban development, environment, health, and transport), cities in Asia, the private sector and development agencies to provide leadership and technical knowledge for Air Quality Management. Clean Air Asia is headquartered in Manila and has offices in Beijing and New Delhi.

Clean Air Asia (CAA)'s work in India involves engaging with Indian cities for better air quality management (AQM). This aligns with the overall CAA work program on broad air quality (AQ) interventions. Its expertise lies in providing scientific inputs to city governments for better air quality management, sustainable transport, low emissions, urban development, and education/ communication for clean air in India. The focus of CAA's work in India is in cities with high impact potential, as well as potential for leveraging wider change.

CAA has been supporting Indian cities in improving air quality management through capacity building and direct support to preparing air action plans. It has been working with the MSME sector for advancing better air quality through technological interventions, enabling them to create a green and sustainable production process. CAA have also launched the Clean Air Knowledge Network (cities4cleanair.com), a forum that connects AQ experts and practitioners from across India and city officials with an objective to promote knowledge sharing across cities on AQ issues and share best practices. A major component of CAA's India Program is education for better air quality. CAA's Youth Clean Air Network (YCAN) is volunteer

program in which youth can passionately work together for better air quality. In past, the Indian team has worked green freight and sustainable mobility projects, conducting walkability studies in Indian cities, developing the Walkability App, the National Bus Fuel Efficiency Framework, the Green Trucks Toolkits for India, and an online freight brokerage platform.

Clean Air Asia India
Basement C-3 Green Park Extension,
New Delhi 110016 INDIA
T: +91 11 40395508
E: india@cleanairasia.org
W: www.cleanairasia.org
www.youthforcleanair.com
www.cities4cleanair.com
www.cleanairhealthychildren.com

Vidarbha Industries Association

Vidarbha Industries Association, (VIA) Nagpur is a premier organisation for the promotion and development of the industries in Vidarbha Region that is focusing on growth of all the potent sectors of the region for more than 57 years now. The organization was formed in 1964, with the sole objective of achieving rapid industrialisation. VIA is popularly known and recognised by the State, Central and local Government bodies as a pioneer Industries association of Vidarbha.

The office bearers of VIA also holds an important position as a representative in several Central and State Government Committees for industry.

Towards the promotion and harnessing of balanced industrial development, the VIA tirelessly encourages entrepreneurial spirit through its efforts which include:

- Continuous interaction and dialogue with all departments of Central Government, State Government, Local Government, Banks and Financial Institutions on all matters concerning the industries and to help formulate policies for rapid industrialization of the region.
- Encouraging industrialists from India and abroad to establish units in Vidarbha.
- Resourcing project ideas for entrepreneurs.
- Organizing Conferences, Seminars, educative and informative programs on various topics of functional interest for entrepreneurs/ industries.
- Playing the vital role of catalyst between industries and educational /research institutes for optimum utilization of knowledge and skill.
- Creating a comprehensive database of technology and information relating to industry for member entrepreneurs.
- Devising and implementing schemes to promote entrepreneurship among ladies and youngsters.
- Updating members on various issues related to trade, commerce and industry.
- To provide facilities for exchange of information and opinion of interest to the industry.

Vidarbha Industries Association
1st Floor, Udyog Bhawan,
Civil Lines, Nagpur - 440 001(India)
T: 91 712 2561211 / 712 2554090
E: viangpindia@gmail.com • **W**: www.via-india.com

SCAN THIS QR CODE

TO FOLLOW US ON SOCIAL MEDIA

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with over 9000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 294 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

As India marches towards its 75th year of Independence in 2022, CII, with the Theme for 2021-22 as **Building India for a New World: Competitiveness, Growth, Sustainability, Technology**, rededicates itself to meeting the aspirations of citizens for a morally, economically and technologically advanced country in partnership with the Government, Industry and all stakeholders.

With 62 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

Confederation of Indian Industry
The Mantosh Sondhi Centre
23, Institutional Area, Lodi Road, New Delhi – 110 003 (India)
T: 91 11 45771000 / 24629994-7
E: info@cii.in • **W**: www.cii.in

Follow us on:

cii.in/facebook cii.in/twitter cii.in/linkedin cii.in/youtube

Reach us via our Membership Helpline: 00-91-99104 46244, 91 11 41193300

CII Helpline Toll Free Number: 1800-103-1244

CII-ITC Centre of Excellence for Sustainable Development

CII-ITC Centre of Excellence for Sustainable Development is a not-for-profit, industry-led institution that helps business become sustainable organisations. It is on a mission to catalyse innovative ideas and solutions, in India, and globally, to enable business, and its stakeholders, in sustainable value creation. It's knowledge, action and recognition activities enable companies to be future ready, improve footprints profiles, and advocate policymakers and legislators to improve standards of sustainable business through domestic and global policy interventions.

CESD leverages its role of all-inclusive ecosystem player, partnering industry, government, and civil society. It has been a pioneer of environment management systems, biodiversity mapping, sustainability reporting, integrated reporting, and social & natural capital valuation in India, thus upgrading business in India to sustainable competitiveness. With two locations in India, CESD operates across the country and has also been active in parts of South and South East Asia, Middle East, and Africa. It has held institutional partnerships and memberships of the United Nations Global Compact, Global Reporting Initiative, International Integrated Reporting Council, Carbon Disclosure Project, development agencies of Canada, the USA, the UK, and Germany.

CII-ITC Centre of Excellence for Sustainable Development
3rd Floor, Andhra Association, 24/25 Institutional Area,
Lodhi Road, New Delhi 110003

Thapar House, 2nd Floor, 124, Janpath New Delhi
W: www.sustainabledevelopment.in

/company/1526422 showcase/cleaner-air-better-life /ciicesd /ciicesd /user/ciicesd