GO-GREEN
PROBLEM STATEMENT

TO CREATE AN OPEN-ENDED FRAMEWORK THAT EVALUATES THE ENVIRONMENTAL IMPACT OF VARIOUS HUMAN INDUSTRIAL ACTIVITIES AND PURSUITS, SOCIAL RESPONSIBILITY , AND GOVERNANCE PRACTICES, AND GOES BEYOND ASSESSMENT TO PROPOSE ACTIONABLE MEASURES.

AADYA UMRAO 210003,ADITI SINGH 210054, SURAJ MEENA 211081, SRIJAN KUMAR 211056

MAJOR HUMAN INDUSTRIAL ACTIVITIES IMPACTING THE ENVIRONMENT

1.COAL MINING AND BURNING

1. **Deforestation and habitat destruction**:
Coal mining often requires the clearing of forests and the destruction of habitats to access coal deposits. This leads to the loss of biodiversity and disruption of ecosystems, impacting plants, animals, and aquatic life.

2.**Water pollution**:
Coal mining can contaminate water sources through the release of pollutants. Acid mine drainage occurs when water comes into contact with exposed coal and minerals, resulting in acidic water that can harm aquatic life and degrade water quality. Coal mining operations can also produce runoff containing heavy metals and other toxic substances that can enter rivers, streams, and groundwater.

3.**Air pollution:**
Burning coal for energy generation releases various air pollutants into the atmosphere. These include sulfur dioxide (SO_2), nitrogen oxides (NOx), particulate matter (PM), and mercury.

4.**Land subsidence and instability**:
Coal mining often involves underground mining methods, which can lead to land subsidence and ground instability. This can result in the sinking or collapse of the land surface, damaging infrastructure, and disrupting ecosystems.

2.ELECTRICITY GENERATION

1.Fossil Fuels (Coal, Oil, Natural Gas):
  • Greenhouse gas emissions:
The combustion of fossil fuels releases carbon dioxide (CO2), methane (CH4), and other greenhouse gases into the atmosphere, contributing to climate change and global warming.
  • Air pollution:
Burning fossil fuels releases pollutants such as sulfur dioxide (SO2), nitrogen oxides (NOx), particulate matter (PM), and volatile organic compounds (VOCs), which contribute to smog, acid rain

2.Nuclear Power:
  • Radioactive waste:
Nuclear power generates radioactive waste that needs to be managed and stored properly to prevent contamination and potential health risks. The long-term storage of nuclear waste is a major challenge.

3.Tidal and Wave Energy:
>Marine ecosystem impact:
Deploying tidal and wave energy devices in coastal areas can potentially disrupt marine ecosystems and affect marine life, including fish and marine mammals. Proper site selection and impact assessments are important to minimize environmental harm.

3.MANUFACTURING

1.**Waste crisis due to plastic manufacturing:**
Plastic waste has become a global environmental crisis, as it is a significant source of pollution and poses a threat to the world's ecosystems.

2.**The Destruction of Wildlife:**
Factories can also be directly blamed for destroying certain areas of nature on our beautiful planet. Forests are torn down for wood which takes away the natural habitat or animals and other wildlife while mining also forces animals to look for somewhere else to live in the hope of survival.

3.**Resource Depletion:**
Manufacturing requires large amounts of natural resources such as water, minerals, and fossil fuels. The extraction and consumption of these resources can lead to their depletion, causing long-term environmental damage.

4.**Energy Consumption:**
Manufacturing processes often require substantial energy inputs, especially in industries such as steel, cement, and chemical production. The majority of energy is derived from non-renewable sources like coal, oil, and natural gas, leading to increased greenhouse gas emissions and climate change.

4.FAST FASHION

1.Increased Clothing Waste:
Fast fashion encourages the "throwaway culture," where clothes are frequently purchased and quickly discarded. This results in a massive amount of clothing waste that ends up in landfills, contributing to pollution and resource depletion.

2. **Textile Production**:
Fast fashion relies on the production of large quantities of textiles, predominantly made from non-renewable resources such as petroleum-based synthetic fibers (e.g., polyester). The production process requires vast amounts of water, energy, and chemicals, contributing to water pollution, carbon emissions, and depletion of natural resources.

3.**Chemical Usage**:
Fast fashion often involves the use of toxic chemicals in dyeing, printing, and finishing textiles. These chemicals, such as azo dyes and chlorine bleach, can contaminate water sources, harm aquatic life, and pose health risks to workers and consumers.

4.**Carbon Footprint:**
The production and transportation of fast fashion garments contribute to significant carbon emissions. Raw material extraction, manufacturing processes, long-distance shipping, and disposal all generate greenhouse gases, contributing to climate change.

5.Water Pollution:
Fast fashion relies heavily on water-intensive processes, including dyeing and finishing textiles. The wastewater discharged from these processes often contains hazardous chemicals and synthetic dyes, polluting water bodies and endangering aquatic ecosystems.

6.Biodiversity and Land Use:
Fast fashion's demand for raw materials can lead to increased pressure on ecosystems and biodiversity. Land conversion for cotton cultivation or the production of materials like viscose (made from trees) can result in deforestation, habitat loss, and the disruption of delicate ecosystems.

5.OIL SPILLS

1. **Marine and Aquatic Ecosystems:**
Oil spills can have devastating effects on marine and aquatic ecosystems. The oil forms a slick on the water surface, blocking sunlight and reducing oxygen exchange, leading to the suffocation of marine life. The oil can also coat and smother plants, coral reefs, and other organisms, causing long-term damage or death. The toxicity of the spilled oil can harm fish, shellfish, and other marine organisms, affecting entire food chains and causing population declines.

2. **Water Contamination:**
Oil spills contaminate water bodies, including rivers, lakes, and coastal areas. The spilled oil contains toxic chemicals, heavy metals, and hydrocarbons that can persist in the water for an extended period. This contamination affects the quality of drinking water, destroys habitats, and disrupts the delicate balance of aquatic ecosystems.

3. **Coastal Habitats and Wetlands:**
Coastal habitats and wetlands, which are crucial for numerous species and act as natural buffers against storms and erosion, are highly susceptible to oil spills. The oil can penetrate these delicate ecosystems, smother vegetation, and disrupt the intricate balance of organisms that rely on them. The loss of coastal habitats due to oil spills can have long-term implications for biodiversity and the health of coastal communities.

4. Long-Term Environmental Impacts:
Even after initial cleanup efforts, oil residues can persist in the environment for years. These residues can continue to release toxic chemicals and harm organisms over an extended period. Some oil compounds, such as polycyclic aromatic hydrocarbons (PAHs), can accumulate in sediments and the tissues of marine organisms, potentially entering the food chain and posing risks to human health.

6.TRANSPORT

1. **Greenhouse Gas Emissions:**
The burning of fossil fuels in vehicles, such as cars, trucks, ships, and airplanes, releases carbon dioxide (CO_2) and other greenhouse gases into the atmosphere. These emissions are a significant contributor to climate change, leading to global warming and associated environmental and societal impacts.

2. **Noise Pollution**:
Transport, particularly road and air transport, generates noise pollution that can have detrimental effects on human health and wildlife. Continuous exposure to high levels of noise can lead to stress, hearing impairment, and disturbance of ecosystems and animal communication.

3. **Resource Consumption**:
The transport sector is a significant consumer of natural resources, particularly petroleum and its derivatives. The extraction and consumption of these non-renewable resources contribute to resource depletion and geopolitical conflicts over access to oil reserves.

4. **Land Use and Urbanization:**
Expanding transportation networks, including roads and parking lots, require significant land use. This leads to the conversion of natural areas and agricultural land into infrastructure, contributing to the loss of biodiversity and the fragmentation of ecosystems. Additionally, the growth of urban areas to accommodate transport infrastructure leads to increased energy consumption and environmental pressures.

GOVERNANCE PRACTICES

1.COAL MINING AND BURNING

- ## STEPS TAKEN BY CENTRAL GOVT.

- Conservation of minerals shall be construed not in the restrictive sense of abstinence from consumption or preservation for use in the distant future but as a positive concept leading to augmentation of reserve base through improvement in mining methods, beneficiation and utilisation of low grade ore and rejects and recovery of associated minerals.

- All mining shall be undertaken within the parameters of a comprehensive Sustainable Development Framework which, inter-alia, includes guiding principles for a miner to leave the mining area in a better ecological condition after mining and for optimum utilization of the country's natural mineral resources.

- Section 18 of Mines and Minerals (Development and Regulation) Act, 1957 empowers Central Government to frame rules for the conservation and systematic development of minerals and for the protection of environment by preventing or controlling any pollution which may be caused by prospecting or mining operations. Accordingly, Mineral Conservation and Development Rules (MCDR), 1988 were framed wherein Rules 31 to 41 are on regulation of environmental aspects of mining. As regulators, Indian Bureau of Mines (IBM) (a subordinate office of the Ministry of Mines) and State Governments approve the mining plan /scheme of mining for systematic and optimum utilisation/extraction of mineral.

- The Ministry of Environment, Forests and Climate Change has notified the Environment Impact Assessment (EIA) Notification, 2006 on 14th September, 2006 under the provisions of Environment (Protection) Act, 1986 to regulate the grant of environment clearance for various projects including mining projects. The impact on environment due to mining projects is assessed by an EIA study. Based on the same, Environmental Management Plan is prepared which is considered and the Environment Clearance is granted stipulating conditions to regulate impact on environment due to the project.

- The **National Ambient Air Quality Standards, 2009 (NAAQS)** notified by MoEF&CC in November 2009 mandated monitoring of Particulate Matters (PM10 and PM2.5) on annual and 24 hour basis. Although these norms came into effect from November 2009, ambient air quality was monitored in Eastern Coalfields Limited (ECL) only from May 2015 for the cluster of mines. Further, six locations of ECL were monitored only till March 2015, although PM10 level in these stations always exceeded the prescribed norm (100 µg/cum) under NAAQS (Paras 4.4.1 & 4.4.2).

- The average ash content in the coal extracted by Hingula, Jagannath, Basundhara (W) and IB Valley mines of Mahanadi Coalfields Limited (MCL) ranged between 40.1 per cent and 43.8 per cent. Although MCL contemplated setting of four washeries as early as in March 2008 for supply of beneficiated coal to thermal plants, these have not been commissioned so far (November 2018). The ash content in the coal supplies executed by Central Coalfields Limited (CCL) also exceeded 34 per cent

- Construction of silo at Gevra OCM was completed belatedly in February 2016 at a cost of ` 138.85 crore. However, works relating to railway siding remained (November 2018) incomplete and coal produced from Gevra OCM continued to be transported through road, thereby contributing to dust generation. In Lingaraj and Lakhanpur projects of MCL, silo was not operationalised due to absence of railway connectivity and coal continued to be transported by road. In Block B mines of Northern Coalfields Limited, coal could not be dispatched through Coal Handling Plant due to absence of rail connectivity and, hence, coal continued to be transported by road beyond August 2016, thereby contributing to air pollution. (Paras 4.9.1, 4.9.2 and 4.9.3).

- During 2013-18, 62 lakh Kilo-litre (KL) of untreated water was discharged in nearby water bodies by Lakhanpur (2.95 lakh KL) and Basundhara (W) mines (59.05 lakh KL) of MCL thereby contaminating ground water. Further, CCL, Bharat Coking Coalfields Limited (BCCL) and South Eastern Coalfields Limited (SECL) continued to use ground water for their mining operations without obtaining No Objection Certificate (NOC) from Central Ground Water Authority (CGWA) (Paras 5.2.1& 5.8.1).

- Out of 23 OC/mixed mines selected for audit, in 13 mines across five subsidiaries, though topsoil was stacked in the earmarked area and reported periodically, basic records of topsoil indicating the quantity and areas of stacking were not maintained. As at the end of March 2018, in three mines of Western Coalfields Limited (WCL), although 75.30 lakh cum of topsoil was stacked at earmarked sites, it remained unutilised since 2013-14 (Paras 6.1.1 & 6.1.2).

2.ELECTRICITY GENERATION

Special Purpose Vehicle (SPV) for Afforestation

A Special Purpose Vehicle is being set up jointly by NTPC and other Central Power Sector Undertakings as a Registered Society to take up afforestation and environmental measures in order to reduce the carbon dioxide in the atmosphere. The objectives of the Society shall be to:

- Undertake fruitful channelising of investments by members to increase the national forest cover.
- Identify suitable lands for afforestation for power projects of NTPC and other members through Ministry of Environment and Forests (MOEF) which will coordinate with the State Forest Departments/District Rural Development Authority etc.
- Facilitate quick procurement of forest clearance for the forestland proposed to be acquired by NTPC and other members for the future projects to be set up.
- Interact with MOEF to score off the necessary compensatory afforestation required for projects of NTPC and other members, which needs diversion of forestland.

It is noteworthy that NTPC has already planted over 1.45 crore trees, which is one of the biggest afforestation efforts in the country. In fact the ambient temperature around the Ramagundam Station of NTPC has come down by 30 Celsius due to the afforestation done by NTPC as revealed in a study by the National Remote Sensing Agency (NRSA), Hyderabad.

Fly Ash Utilisation Action Plan

Coal / Lignite based Thermal Power Generation has been the backbone of power capacity addition in the country. Indian coal is of low grade with ash content of the order of 30-60 % in comparison to imported coals which have a low ash content of the order of 2-20%. A large quantity of ash is, thus being generated at Coal / Lignite based Thermal Power Stations in the country, which not only requires a large area of precious land for its disposal but is also one of the sources of pollution of both air and water.

All Coal / Lignite based Thermal Power are required to follow the Ministry of Environment, Forests (MoEF) Notifications on fly ash utilization to achieve 100% utilization of fly ash. Ministry of Environment, Forest and Climate Change (MoEF&CC) has now issued a revised Notification on 31st December 2021 in supersession of earlier Notifications in order to widen the scope of ash utilization.

CEA compiles annual report on Fly Ash Generation at Coal / Lignite based Thermal Power Stations and its utilization in the country. As per the CEA report, ash utilization during Year 2021-22:

No. of Thermal Power Stations from which data have been received

200

Installed capacity (Mega watts)

213620.5

Coal Consumed (Million tons)

759.02

Fly Ash Generation (Million tons)

270.82

Fly Ash Utilization (Million tons)

259.86

FPercentage Utilization (%)
95.95
Percentage Average Ash Content (%)
35.68
In line with the MoEF&CC Notification dated 31.12.2021, Ministry of Power had issued an Advisory on 22.02.2022 for all Coal / Lignite based Thermal Power to dispose of the ash in a transparent manner.

Initiatives for improving the environmental performance of coal based stations

i. The monitoring of emissions by thermal power companies come under the purview of CPCB/SPCB. The emissions from thermal power plants is being monitored through online OCEMS portal of CPCB since 2017, for both central and state to keep a check on emission level from these power plants. However, Central Electricity Authority (CEA) compiles a CO_2 database for all Grid connected Power stations in the country on annual basis and publish the same. The objective of this database is to establish authentic and consistent quantification of the CO_2 emission baseline.

ii. The Thermal Power Stations are required to meet the environmental pollution standard set by MoEF&CC /CPCB/ SPCB from time to time. MOEF&CC has notified new environmental norms on 7th December 2015 for thermal power plants related to Particulate Matter (PM), SO_2, NOx& Mercury emissions and also vide its notification dated 31.03.2021 had issued categorized thermal power plants in category A, B & C for compliance of new emission norms including provision of penalty for non-compliance. Further, MOEF&CC vide its notification dated 5th September 2022 has granted two year Extension to TPPs for compliance of SO_2 emission norms

iii. Many TPPs have already adopted use of efficient technologies i.e. from subcritical to supercritical and now using ultra-supercritical technology in order to improve efficiency, thereby reducing coal consumption and thereby reducing emissions. A total capacity of Supercritical and Ultra-supercritical units of 63170 MW (91 supercritical Units) and 1320 MW (2 ultra-supercritical units) have been commissioned till 13.03.2023.

iv. The capacity of about 18,362.24 MW comprising 260 units of inefficient and old thermal power generation units has already been retired till 31.12.2022.

v. Ministry of Power on 08.10.2021 has issued revised policy on Bio-mass Utilization for Power Generation through Co-firing in Coal based Power Plants to use 5-10% blend of biomass pellets made, primarily of agro-residue along with coal after assessing the technical feasibility viz. safety aspect etc.

vi. Thermal Power Plants of total capacity of about 181 GW is covered under Perform, Achieve, Trade (PAT) scheme and they are given mandatory targets to reduce their specific energy consumption i.e. Net Heat Rate (kcal/kwh). BEE is the nodal agency for implementing the PAT scheme.

vii. Carbon Capture, utilisation and Storage (CCUS): CCUS refers to suite of technologies, which will help to remove CO_2 before it enters atmosphere. These technologies can play a diverse role in meeting global energy and climate goals. NTPC has taken up an R&D project to setup a 10 TPD Flue Gas CO_2 to Methanol Plant at NTPC Vindhyachal to capture the CO_2 from waste flue gases to convert it into Methanol.

Clean Development Mechanism (CDM)

To address increasing concerns related to the environment and to improve environmental performance, the services of Tata Energy Research Institute (TERI) have been engaged for providing consultancy services to the Ministry of Power on CDM. The terms of reference include project formulation, base line surveys for each project, negotiations with the CDM parties, identification of the counterpart CDM parties from the developed countries, cost of CO_2 monitoring and verification of CO_2 emission reduction and supervision of project implementation.

ISO 14001
Established in November 1975 for nation's Sustainable Power Development, National Thermal Power Corporation Ltd. (NTPC) is today India's largest power utility with an installed capacity of 21,749 MW (19% of India's installed capacity) contributing to 26% of total generation in the country, with high availability factor of its power plants. NTPC has plans to double its capacity. NTPC has recently diversified into the hydro sector and formed for joint venture companies for distribution, R&M, etc. Environment Management is a high priority area in the company and several Policies have been formulated to ensure generation of green power. Through persuasion of sound environmental management systems and practices , NTPC's 18 stations have been accredited with ISO:14001 certification. As a responsible corporate citizen, NTPC is a member of Global Compact a UN initiative for Corporate social responsibility.

3.MANUFACTURING

1. **Environmental Impact Assessment (EIA)**:
The government mandates the submission of an Environmental Impact Assessment report for manufacturing projects that have the potential to cause significant environmental impacts. The EIA process assesses the potential environmental, social, and economic consequences of proposed projects, helping in decision-making and ensuring environmental safeguards.

2. **Pollution Control Laws and Regulations:**
India has several pollution control laws and regulations in place to regulate manufacturing activities and limit pollution. The Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, and the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, are some key regulations that govern pollution control measures in the manufacturing sector.

3. **Industrial Effluent and Emissions Standards**:
The government has set effluent discharge and emissions standards for different industries to control pollution. The Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) monitor compliance with these standards through regular inspections and enforcement actions.

4. **Waste Management Regulations**:
The government has implemented regulations and guidelines for the management of hazardous and non-hazardous waste generated by manufacturing activities. The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, and the Plastic Waste Management Rules, 2016, provide guidelines for waste handling, treatment, and disposal.

5. **Clean Technology Promotion**:
The government encourages the adoption of clean and sustainable technologies in manufacturing through various initiatives. The National Clean Energy Fund (NCEF) supports research, development, and deployment of clean technologies, including those in the manufacturing sector.

6. **Green Manufacturing and Sustainability Initiatives:**
The government promotes green manufacturing practices through initiatives such as the Green Manufacturing Excellence Awards and the GreenPro certification scheme. These initiatives aim to recognize and encourage manufacturers adopting environmentally sustainable practices.

7. **Incentives and Subsidies:**
The government provides incentives, tax benefits, and subsidies to manufacturers adopting environmentally friendly practices, such as energy efficiency measures, waste reduction, and renewable energy adoption. These incentives aim to encourage sustainable manufacturing practices and reduce the environmental impact of industries.

4.FAST FASHION

- **Sustainable Clothing Initiatives:**
The Ministry of Textiles has initiated various programs to promote sustainable and eco-friendly practices in the textile and clothing industry. For example, the Sustainable and Accelerated Adoption of Efficient Textile Technologies (SAATHI) initiative encourages textile units to adopt energy-efficient machinery and practices to reduce resource consumption.

- **Ethical Trading and Labor Standards:**
The Indian government has implemented regulations and programs aimed at protecting workers' rights and ensuring fair labor practices in the textile and garment industry. The "Garments and Other Made-Up Articles (Development and Regulation) Bill" seeks to regulate employment conditions and improve social welfare measures for workers.

- **Make in India Campaign:**
The Make in India initiative promotes domestic manufacturing and encourages investment in various sectors, including textiles and apparel. While the campaign doesn't specifically target fast fashion, it aims to boost local manufacturing and promote sustainable practices in the long term.

- **Green Certification Schemes:**
The Indian government, through agencies like the Bureau of Indian Standards (BIS), has implemented voluntary certification schemes like the Indian Green Building Council (IGBC) Green Factory Building rating system. These schemes encourage manufacturers to adopt environmentally sustainable practices, including those related to the textile and clothing industry.

- **Extended Producer Responsibility (EPR):**

The Indian government has introduced EPR provisions for plastic waste management, which can indirectly impact the fashion industry. These regulations require producers to take responsibility for the end-of-life management of their products, encouraging them to adopt sustainable practices and reduce waste generation.

5.OIL SPILLS

- As a measure for prevention of oil spills at the Indian ports, Indian Coast Guard being a nodal agency for National Oil Spill Disaster Contingency Plan has directed all the ports to pre-pare Local Oil Spill Disaster Contingency Plan. Tier-1 pollution response equipments as per "**National Oil Spill Disaster Contingency Plan (NOS-DCP)**" has been maintained at many ports. Regular inspection of ships and patrolling of water has been carried out.

- Tankers above 25 years of age are not allowed to enter the ports.

- The Indian government has enacted the **Merchant Shipping Act, 1958**, and the **Indian Ports Act, 1908**, which include provisions for penalties and liabilities related to oil spills and pollution.

- The **Coastal Regulation Zone (CRZ) Notification, 2011**, regulates activities in coastal areas to protect the coastal environment from pollution and degradation, including oil spills.

6.TRANSPORT
• STEPS TAKEN BY CENTRAL GOVT.

- The Central Government has launched **National Clean Air Programme (NCAP)** under the Central Sector "Control of Pollution" Scheme as a long-term, time-bound, national level strategy to tackle the air pollution problem across the country in a comprehensive manner with targets to achieve 20 % to 30 % reduction in PM10 and PM2.5 concentrations by 2024 keeping 2017 as the base year for the comparison of concentration.102 non-attainment cities mostly in Indo-Gangetic Plains have been identified based on ambient air quality data for the period 2011 – 2015 and WHO report 2014/2018. The city specific Action Plans have been approved for all 102 non-attainment cities for implementation on ground.

- The Central Government has notified a **Comprehensive Action Plan (CAP) in 2018** identifying timelines and implementing agencies for actions identified for prevention, control and mitigation of air pollution in Delhi and NCR.

- **Graded Response Action Plan (GRAP)** was notified on January 12, 2017, for prevention, control and abatement of air pollution in Delhi and NCR. It identifies graded measures and implementing agencies for response to four AQI categories, namely, Moderate to Poor, Very Poor, Severe and Severe + or Emergency.

- Several steps have been taken for creating awareness amongst the general population. These steps are as follows.

- **SAMEER app** has been launched wherein air quality information is available to public along with provision for registering complaints against air polluting activities.

- Air quality information collection and dissemination are done from a centralized location. It provides real time air quality status to all stakeholders.
- A dedicated media corner, Twitter and Facebook accounts have been created for access to air quality related information and to provide a platform for lodging complaints by general population.
- Crowd sourcing of innovative ideas/ suggestions/proposals from public is done through CPCB website to strengthen efforts for improving air quality in Delhi-NCR.
- The Ministry of Environment, Forest and Climate Change is implementing Environment Education, Awareness and Training Scheme with the objective to promote environmental awareness among all sections of the society and to mobilize people's participation for conservation of environment. Under the **National Green Corps (NGC)** programme of the Ministry, about one lakh schools have been identified as Eco-clubs, wherein, nearly thirty lakh students are actively participating in various environment protection and conservation activities, including the issues related to the air pollution.
- Ministry is promoting peoples participation and awareness building among citizens for environmental conservation that focus on promotion of cycling, saving water and electricity, growing trees, proper maintenance of vehicles, following of lane discipline and reducing congestion on roads by car pooling etc.
- For field feedback on air polluting activities in Delhi and major NCR towns, 46 teams of Central Pollution Control Board have been deployed since October 7, 2019.
- The initiatives taken by the Government for the abatement and control of air pollution in Delhi and NCR since 2016 have bore good results. As per **Continuous Ambient Air Quality Monitoring Stations (CAAQMS) data**, the number of 'Good', 'Satisfactory', and 'Moderate' days has progressively increased to 159 in 2018, as compared to 152 in 2017 and 106 in 2016, and the number of 'Poor', 'Very Poor' and 'Severe' days has reduced to 206, compared to 213 in 2017 and 246 in 2016. In Delhi, reduction in PM2.5 levels in 2018 is 7.3% over 2017 and 14.8% over 2016. In Delhi, reduction in PM10 levels in 2018 is 8.6% over 2017 and 16.5% over 2016.

SOCIAL RESPONSIBILITY

1.COAL MINING AND BURNING

- **Transition to Renewable Energy:**
Encourage a shift from coal-based energy production to renewable energy sources such as solar, wind, and hydroelectric power. Promote the development and adoption of clean energy technologies to reduce reliance on coal and mitigate its environmental impact.

- **Improve Mining Practices:**
Promote responsible mining practices by enforcing stringent environmental regulations and safety standards. Encourage the adoption of advanced mining technologies that minimize ecological damage, prevent soil and water pollution, and ensure the rehabilitation of affected areas.

- **Rehabilitation and Compensation:**
Ensure adequate compensation and rehabilitation measures for communities affected by coal mining activities. Support initiatives that focus on alternative livelihood options and sustainable development in affected regions.

- **Health Awareness and Care**:
Raise awareness about the health hazards associated with coal mining and burning, particularly for communities living in close proximity to coal mines and power plants. Promote access to healthcare services and screening programs for respiratory and other related health issues.

- **Community Engagement**:
Encourage meaningful participation and consultation with local communities in decision-making processes related to coal mining and burning. Ensure that their concerns, rights, and well-being are taken into account.

2.ELECTRICITY GENERATION

- **Community Engagement and Consultation:**

Power generation projects often have significant impacts on local communities, including land acquisition, displacement, and changes in livelihoods. Socially responsible electricity generation companies should engage with affected communities, respect their rights, and ensure meaningful consultation and participation in project planning and decision-making processes. It is important to address the concerns and needs of local communities and implement measures to mitigate negative social and economic impacts.

- **Health and Safety:**

Power plants can pose health and safety risks for workers and nearby communities. Companies should prioritize the safety and well-being of their employees by providing a safe working environment, appropriate safety equipment, and training programs. Moreover, they should assess and mitigate potential health risks for communities, especially those located in the vicinity of power plants, by monitoring air and water quality and taking necessary measures to reduce pollution and health hazards.

- **Renewable Energy Transition:**

India has been striving to increase the share of renewable energy in its electricity generation mix. Socially responsible electricity generation involves prioritizing the development and deployment of renewable energy sources such as solar, wind, hydro, and biomass. Power companies should actively invest in renewable energy projects, promote research and development of clean technologies, and contribute to the overall transition towards a low-carbon economy.

3.MANUFACTURING

- **Ethical Labor Practices**:

Socially responsible manufacturers should ensure fair and ethical treatment of their workers. This includes providing safe and healthy working conditions, fair wages, reasonable working hours, and adhering to labor laws and regulations. Manufacturers should also promote non-discrimination, respect human rights, and prohibit child labor and forced labor in their supply chains.

- **Product Safety and Quality:**

Manufacturers should prioritize the safety and quality of their products. This includes adhering to relevant product safety standards, conducting thorough testing and quality control processes, and providing accurate and transparent information to consumers. Socially responsible manufacturers should strive to produce goods that are safe, reliable, and meet the expectations of consumers.

- **Community Engagement:**

Manufacturers should engage with local communities and be aware of their social and economic impact. This involves consulting with and respecting the rights and interests of local stakeholders, contributing to community development initiatives, and investing in social welfare programs. Manufacturers can support education, healthcare, infrastructure development, and skill-building initiatives that benefit the local communities in which they operate.

- **Supply Chain Management:**

Manufacturers have a responsibility to ensure that their supply chains uphold ethical standards. This involves conducting due diligence to identify and address risks related to human rights violations, environmental impact, and unethical practices. Collaborating with suppliers to improve their social and environmental performance, promoting responsible sourcing practices, and engaging in transparency and traceability are important steps.

4.FAST FASHION

- **Environmental Sustainability:**

Fast fashion has significant environmental impacts, including excessive waste generation, high water consumption, and pollution from chemical dyes and finishes. Socially responsible fast fashion companies should adopt sustainable practices, such as reducing waste through recycling and upcycling, using eco-friendly materials, promoting responsible water management, and minimizing carbon emissions. They should also invest in research and development for more sustainable manufacturing processes and encourage circular economy models.

- **Consumer Education:**

Socially responsible fast fashion companies should educate consumers about the environmental and social impacts of their purchasing decisions. By promoting conscious consumption and highlighting the importance of quality over quantity, brands can encourage consumers to make more informed and sustainable choices. This can be done through awareness campaigns, labeling initiatives, and providing information on sustainable alternatives.

- **Worker Empowerment:**

Fast fashion brands should prioritize the empowerment and well-being of workers within their supply chains. This can include initiatives such as providing fair wages, ensuring safe and healthy working conditions, offering training and skill development programs, and supporting workers' rights to organize and collectively bargain. Brands should also collaborate with local organizations and initiatives that promote worker welfare.

5.OIL SPILLS

- **Community Engagement and Support:**

Social responsibility in oil spill incidents involves actively engaging and supporting affected communities. This can be achieved through open communication, regular updates on the progress of cleanup and restoration efforts, and involving community members in decision-making processes. Engaging local stakeholders in long-term monitoring and restoration initiatives can help rebuild trust and ensure that community concerns are addressed.

- **Prevention and Preparedness:**

A key aspect of social responsibility is preventing oil spills through rigorous safety measures and adherence to best practices. Companies involved in oil extraction, transportation, and storage should invest in robust infrastructure, maintain equipment integrity, and implement comprehensive safety protocols. Regular training and preparedness drills should be conducted to ensure rapid response capabilities in the event of an oil spill.

- **Regulatory Compliance and Accountability:**

Regulatory bodies play a crucial role in enforcing safety standards and holding responsible parties accountable for oil spills. Social responsibility involves complying with relevant regulations, permits, and licenses related to oil operations. Responsible parties should cooperate fully with regulatory authorities, report incidents promptly, and cooperate in investigations to identify the cause of the spill and prevent future occurrences.

- **Compensation and Remediation**:

Social responsibility requires the responsible party to compensate affected individuals, communities, and businesses for the loss of livelihoods, damages to property, and other related losses resulting from the oil spill. This compensation should be fair, timely, and adequate to help affected communities recover and rebuild their lives. Additionally, responsible parties should undertake remediation measures to restore affected ecosystems to their pre-spill condition.

6.TRANSPORT

- **Accessibility and Inclusion**:
Socially responsible transport should focus on improving accessibility for all individuals, including persons with disabilities, the elderly, and marginalized communities. This involves providing infrastructure that accommodates diverse needs, such as accessible sidewalks, ramps, and public transit facilities. Additionally, efforts should be made to ensure affordable and convenient transportation options are available for underserved areas and remote communities.

- **Public Transport and Shared Mobility**:
Promoting and improving public transport systems is an essential component of social responsibility in the transport sector. Enhancing the affordability, reliability, and convenience of public transit, including buses, metro systems, and trains, can encourage people to shift from private vehicles, reducing congestion and emissions. Supporting and regulating shared mobility options, such as carpooling and ride-sharing services, can also contribute to more sustainable and efficient transportation.

- **Education and Awareness:**
Social responsibility in the transport sector includes raising awareness about the importance of sustainable and safe transportation choices. Education campaigns can promote public understanding of the benefits of using public transit, adopting eco-friendly vehicles, and practicing responsible driving behavior. Providing information on alternative modes of transport, sharing success stories, and highlighting the environmental and social impacts of transportation can inspire behavioral change.

ASSESSMENT AND MEASURES WHICH CAN BE TAKEN

GITHUB LINK TO CODE

Srijan-Kumar/
Sustainability-...

Sustainability Performance Indicators for open end
assessment of Industrial Activities

👥 1   ⊙ 0   ☆ 0   ⑂ 0
Contributor   Issues   Stars   Forks

Srijan-Kumar/Sustainability-Performance-Indicators: Sustainability Performance Indicators for open end assessment of Industrial Activities

Sustainability Performance Indicators for open end assessment of Industrial Activities - GitHub - Srijan-Kumar/Sustainability-Performance-Indicators: Sustainability Performance Indicators for open ...

GitHub

LINK TO THE WEBSITE
HOME.IITK.AC.IN/~SRIJANK21

EXPLAINATION-

A website-"SUSTAING"

- Marks the sustainability of the 10 industrial sectors having major impacts on the environment.The effects will be organized into 8 assessment categories based on the international standard of assessing sustainability.

- Ratings are done as per norms of the demographic area depending on the political and the economic factors which are indexed as multipliers (1-8) .e.g for some countries the pollution is considered far more inferior than the political agendas of the nation.

- The final index is a decimal in range of 0-5,0 being the least sustainable and 5 - most.

- **The aim of this study is to strengthen the capacity of mining industries to assess and improve their environmental sustainability performance through the introduction of a relevant framework**. Specific assessment categories and respective indicators were selected according to predefined steps.

48 methods were identified and clustered into six categories (individual/set of indicators, composite indices, socially responsible investment indices, material and energy flow analysis, life cycle analysis, and environmental accounting), extracting in parallel their key attributes. These categories were further evaluated based on five criteria
(a) ability to promote actions of improvement
(b) ability to help decision making
(c) potential for benchmarking
(d) applicability and ease of use
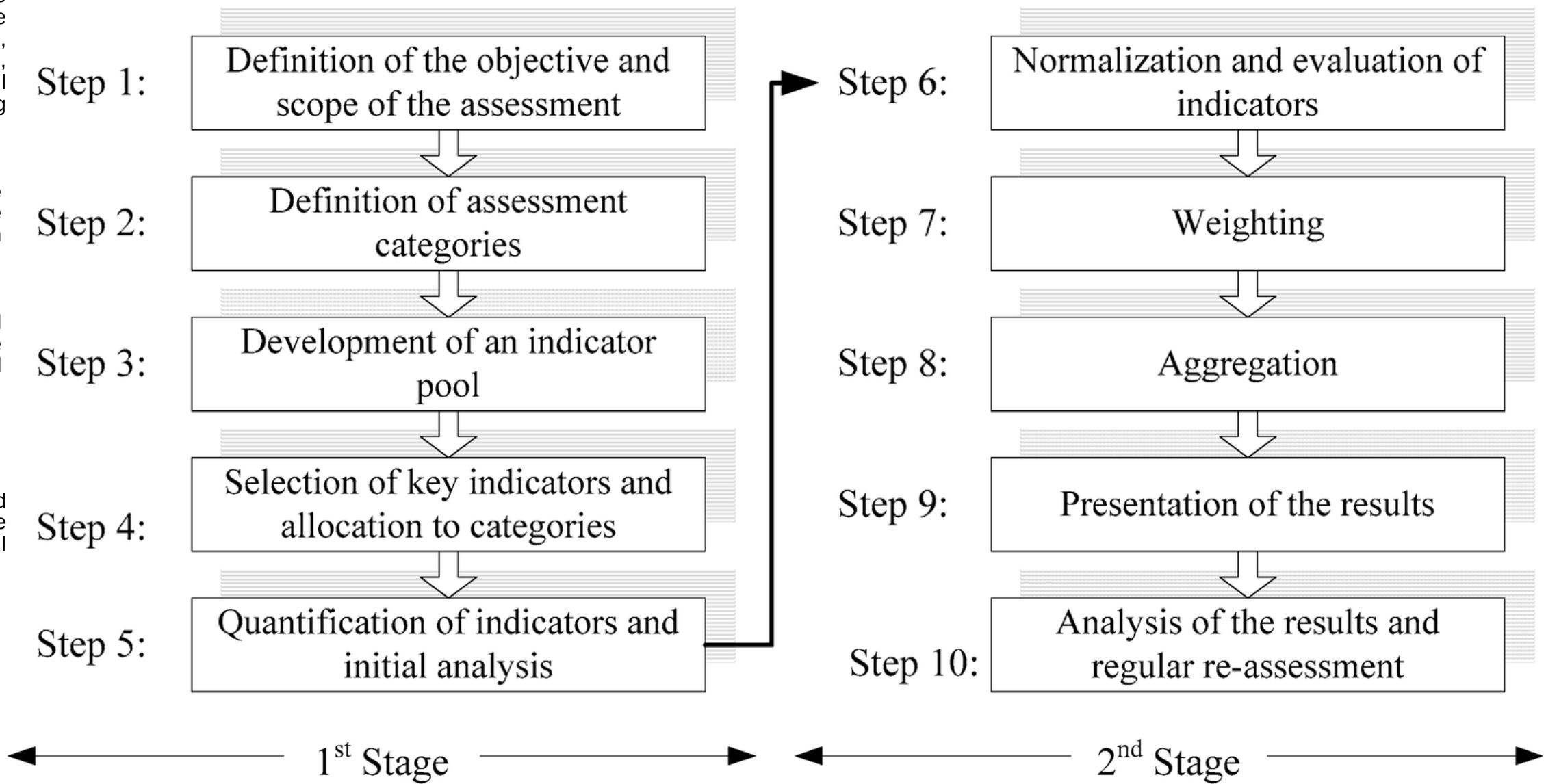(e) integration of wider spatial and temporal characteristics.

An industrial facility should be assessed both in terms of performance and concern and provide environmental sustainability threshold values for every indicator applied.

Indicative objectives include the identification of weaknesses and the development of improvement measures, comparison with other industrial facilities, monitoring the performance of industrial facility over time, and enhancing sustainability reports

In other words, the parameters need to be considered for efficiently assessing the environmental sustainability of the system under examination had to be identified.

An indicator pool was developed including indicators that can potentially be utilized to assess the eight environmental sustainability categories

An indicator pool was developed including indicators that can potentially be utilized to assess the eight environmental sustainability categories

Step 1: Definition of the objective and scope of the assessment

Step 2: Definition of assessment categories

Step 3: Development of an indicator pool

Step 4: Selection of key indicators and allocation to categories

Step 5: Quantification of indicators and initial analysis

Step 6: Normalization and evaluation of indicators

Step 7: Weighting

Step 8: Aggregation

Step 9: Presentation of the results

Step 10: Analysis of the results and regular re-assessment

◄———— 1ˢᵗ Stage ————►   ◄———— 2ⁿᵈ Stage ————►

The first stage comprises steps 1–5 and includes the minimum actions to be conducted by a mining industry on a facility level, who wish to acquire an initial overview of its performance related to environmental sustainability aspects

The second stage comprises the steps 6–10 and includes all actions required for the effective assessment of the environmental sustainability of the facility. The implementation of the second stage results in the development of a final comprehensive environmental score and the identification of environmental "hot spots" that call for improvement.

Name of the Assessment Category
1 Mineral resources and materials
2 Emissions and waste
3 Energy and water
4 Suppliers and environmental performance
5 Biodiversity
6 Land use and rehabilitation
7 Impact on the environmental and climate change
8 Impact on human health

In other words, the parameters need to be considered for efficiently assessing the environmental sustainability of the system under examination had to be identified.

The first stage comprises steps 1–5 and includes the minimum actions to be conducted by a mining industry on a facility level, who wish to acquire an initial overview of its performance related to environmental sustainability aspects

The second stage comprises the steps 6–10 and includes all actions required for the effective assessment of the environmental sustainability of the facility. The implementation of the second stage results in the development of a final comprehensive environmental score and the identification of environmental "hot spots" that call for improvement.

Category 1: Mineral resources and materials
EN1 Total consumption of resources and materials and quantity of products produced (in absolute and relative units)
EN2 Utilization of mining waste
Category 2: Emissions and waste
EN3 Air emissions by type and total (in absolute and relative units)
EN4 Liquid waste by type and total (in absolute and relative units)
EN5 Mining waste to be deposited by type and total (in absolute and relative units)
Category 3: Energy and water
EN6 Energy consumption by type and total (in absolute and relative units)
EN7Total industrial water consumption (in absolute and relative units)
EN8 Percentage of water that is recycled or reused as compared to total consumption
EN9 Availability of water resources at local level
Category 4: Suppliers and environmental performance
EN10 Environmental assessment of suppliers and contractors
EN11 Initiatives to enhance environmental performance, accountability and equity
Category 5: Biodiversity
EN12 Numbers of species included in the IUCN red list or national lists of protected species and are affected by the facility's activities, classified by the level of extinction risk
EN13 Identification and mitigation actions on biodiversity
Category 6: Land use and rehabilitation
EN14 Total area restored to total disruption
Category 7: Impact on the environment and climate change
EN15 Global warming potential
EN16Number and description of environmental accidents
EN17 Hazard risk of utilized materials, emissions and waste
Category 8: Impact on human health
EN18 Ambient air quality of the industrial site
EN19Risk of failure of infrastructure

In other words, the parameters need to be considered for efficiently assessing the environmental sustainability of the system under examination had to be identified.

The first stage comprises steps 1–5 and includes the minimum actions to be conducted by a mining industry on a facility level, who wish to acquire an initial overview of its performance related to environmental sustainability aspects

The second stage comprises the steps 6–10 and includes all actions required for the effective assessment of the environmental sustainability of the facility. The implementation of the second stage results in the development of a final comprehensive environmental score and the identification of environmental "hot spots" that call for improvement.

THANKYOU