Sustainable Environment with focus on downturn of Air Pollution: **Call for stage**

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Introduction

Every year 5th June since first held in 1974, is celebrated as the World Environment Day (WED) which is the biggest annual event for positive environmental action. The theme for 2019 WED is *'Beat air pollution'* and the host nation is China. It is estimated that about 7 million people dies annually because of air pollution. Nine out of ten people worldwide are exposed to levels of air pollutants that exceed safe levels set by the World Health Organization.WED urges governments, enterprises, communities and individuals to come together to explore renewable energy, green technologies and improve air quality in cities and regions across the world. It gives an opportunity to broaden the basis for an enlightened opinion in preserving and enhancing the environment.WED has grown to become a global platform for public outreach, with participation from over 143 countries annually. WED was established by the UN General Assembly in 1972 on the first day of the Stockholm Conference on the Human Environment,resulting from discussions on the integration of human interactions and the environment. Two years later, in 1974 the first WED was held with the theme "Only One Earth" in Spokane, United States. Even though WED celebrations have been held annually since 1974, in 1987 the idea for rotating the centre of these activities through selecting different host countries began. The theme for the year 2018 was "Beat Plastic Pollution". The host nation was India.

Air pollution is the biggest environmental health risk of present time. Airborne pollutants are responsible for about one third of deaths from stroke, chronic respiratory disease, and lung cancer, as well as one quarter of deaths from heart attack. Air pollution is also fundamentally altering our climate, with profound impacts on the health of the planet.

Air Pollution

Air contamination is defined as the presence of toxins that affect the environment. India, as a rapidly developing nation, needs to manage its ecological issues well to minimise contamination of air, water and soil. The manufacturing industry is one of the major air pollutants. Some of the most polluted industries in India include metals, chemicals, compost, petroleum and sustenance. Apart from these, pesticides, cleansers, plastics, solvents, fills, paints, colours, nourishment are also pollutants. In addition, due to advances in nuclear vitality, there has been an expansion in radioactivity in the biosphere. Industrialization that relies on fossil powers contributes to air pollution. Air contamination is an essential issue in mechanical industry which may adversely affect the health of an entire population. Air pollutants from various manufacturing sectors include particulate, dust, SPM, RPSM; oxides of sulphur and nitrogen; hydrogen sulphide; hydrocarbon; hydrogen fluoride; carbon monoxide; ozone; lead; mercury; organic solvents; chlorine and ammonia etc. Besides the above smog is a kind of severe air pollution. This kind of visible air pollution is composed of nitrogen oxides, sulphur oxides, ozone, smoke and other particulates. In certain other cities, such as Delhi, smog severity is often aggravated by stubble burning in agricultural areas. The above indicates that for a sustainable development there is an increased need by the enterprises including micro,

small and medium enterprises (MSMEs) to adopt clean technologies which are energy efficient and renewable.

Causes of air pollution

Causes of air pollution include -

- Household- The main source of household air pollution is the indoor burning of fossil fuels, wood and other biomass-based fuels to cook, heat and light homes. Around 3.8 million premature deaths are caused by indoor air pollution each year, the vast majority of them in the developing world.
- Industry - In many countries, energy production is a leading source of air pollution. Coal-burning power plants are a major contributor, while diesel generators are a growing concern in off-grid areas.
- Transport - The global transport sector accounts for almost one-quarter of energy-related carbon dioxide emissions and this proportion is rising. Transport emissions have been linked to nearly 400,000 premature deaths.
- Agriculture - There are two major sources of air pollution from agriculture: livestock, which produces methane and ammonia, and the burning of agricultural waste. Around 24 percent of all greenhouse gases emitted worldwide come agriculture, forestry and other land use.
- Waste - Open waste burning and organic waste in landfills release harmful dioxins, furans, methane, and black carbon into the atmosphere. Globally, an estimated 40 percent of waste is openly burned.
- Other sources - Not all air pollution comes from human activity. Volcanic eruptions, dust storms and other natural processes also cause problems. Sand and dust storms are particularly concerning.

Some Air Pollution Facts

- 92 percent of people worldwide do not breathe clean air.
- Air pollution costs the global economy $5 trillion every year in welfare costs
- Ground-level ozone pollution is expected to reduce staple crop yields by 26 percent by 2030.

Challenges of Sustainable Development and India's Position

The main challenges to sustainable development that are global in character include poverty and exclusion, unemployment, climate change, conflict and humanitarian aid, building peaceful and inclusive societies, building strong institutions of governance and supporting the rule of law. The global economy is changing. Technology advancements will continue to impact business and lifestyles. The mother earth has to bear the burdens of a huge consumption of its natural and mineral reserves to meet the increasing demands of food, energy and water.

On the other hand there is exponential rise in CO_2 emission in the environment. India is undergoing this dilemma of sustainable development too. Under Make in India mission, it lays emphasis on manufacturing sector which will help create jobs but on the other hand it warrants a strong consistent watch on increase in India's cumulative as well as per capita CO_2 emission rate so that India's position on response to climate change may not weaken globally. India's Nationally Determined Contribution (NDC) targets to lower the emission intensity of GDP by 33%-35% by 2030 below 2005 levels, to increase the share of non-fossil based power generation capacity to 40% of installed electric power capacity by 2030 and to create an additional (cumulative) carbon sink of 2.5-3 GtCO2e through additional forest tree cover by 2030. The Hon'ble Prime Minister Shri Narendra Modi's clarion call on 15th August 2014 for doing business on the tenet of "Zero Defect & Zero Effect (ZED)" is the clear evidence for dealing with the dilemma of sustainable development. Enterprises have to showcase business innovations-technology or commercial to pursue the profit that is inclusive and green and also promote low carbon economy.

Government of India announces Plantation Plan

Among highly populous countries, India (population, about 1.267 billion) has a treepopulation of only 35 billion, leading to just 28 trees per person. Compared to Brazil which has 301 billion trees (1,494 per person), Canada 318 billion (8,953 per person), and China 139 billion (102 trees per person).

India has formulated and launched the National Clean Air Programme (NCAP). This is a long term and time bound national level strategy to tackle the increasing pollution problem across the country. The objective of NCAP is comprehensive plan for prevention, control and abatement of air pollution besides augmenting the air quality monitoring network. The tentative national level target is reduction of PM2.5 and PM10 concentration by 20% – 30% by 2024. The focus of this year WED is on the identified 102 Non attainment cities across the country.

On 3rd June 2019, Shri Nitin Gakari, Hon'ble Union Minister for Road Transport & Highways, Shipping and Ministry of Micro, Small and Medium Enterprises pledged to plant 125 crore trees in the next five yearson both sides of National Highways, which runs through thousands of kilometres across the country. He also set a new target of laying 40 kms of road everyday over the next one-and-a-half years and desired to work on creating roadside amenities in a big way say setting up 2,000 such amenities.

On the WED, Hon'ble Union Minister for Environment, Forest and Climate Change and for the Ministry of Information and Broadcasting Shri Prakash Javadekarstressed that 'Jan Bhagidari' is integral towards tackling the environmental issues and the environment protection has to be a people's movement. "For the amount of oxygen an individual requires, he should plant at least 8-

10 saplings in his lifespan", stressed the Union Minister.

The above calls will be effective only when these targets should be achieved not by planting trees itself but with due care in their maintenance with least mortality in a continuous quality manner.

Quality and Environment as focus of Zero Defect Zero Effect (ZED) Certification for Micro, Small and Medium Enterprises (MSMEs)

MSMEs must strive for utilisation of clean technologies that may include energy efficient technologies, waste utilisation technologies, renewable energy technologies, water efficient technologies and others having no effect on eco environment. Technologies need to be developed for recycling and converting waste to useful products. Ttechnological development & innovation must accelerate the move to a low-carbon pathway. Continuous research efforts should be invariably made for development of eco-friendly Zero-carbon fuels for road freight and for aviation.

Ministry of MSME through Office of the Development Commissioner (MSME) has launched a scheme of financial support to ZED Certification in July 2016. ZED maturity assessment model (Bronze- Silver-Gold-Diamond-Platinum) is applicable for all sectors of manufacturing industries and focuses on MSMEs and small businesses. ZED model is based on the principles of (i) Zero Defect [focus on customer] [Zero non-conformance/non-compliance and Zero waste] and (ii) Zero Effect [focus on society] [Zero air pollution/liquid discharge (ZLD)/solid waste and Zero wastage of natural resources]. ZED Maturity Assessment Model is an integrated and holistic Certification System, which accounts for processes related to Production Managem ent, Quality Management, Design Manage ment, Safety Management, Envi ronmental Management, Energy Management, Natural Resource Management, Human Resource Management, Intellectual Property Manage ment and Performance Management. In the model, all along with quality of products and services, equal emphasis is on the elimination of adverse impacts on the environment, through adequate planning at product and process design, pre-production, production and maintenance activities, post production (disposal after use) and outcome of environment performance. The net result is sustainable development.

Sustainable Environment

The strategy for New India @75 document (November 2018) of NITI Aayog talks about objectives of sustainable environment as to maintain a clean, green and healthy environment with peoples' participation to support higher and inclusive economic growth through sustainable utilization of available natural resources. The 2022-23 goals include the following.

Air pollution

- Bringing down PM2.5 levels in Indian cities to less than 50. [Includes eliminating the practice of burning biomass (crop residue) and to upscale technologies for crop harvesting & utilization of farm residue.]
- Creating 175 GW of renewable energy generation capacity.
- Eliminating crop residue burning.
- Ensuring the coverage of all households with LPG for cooking.

Solid waste management

- Implementing effectively the Solid Waste Management Rules, 2016.

Water pollution

- Encouraging industries to utilize recycled/treated water to the extent possible and ensuring zero discharge of untreated effluents from industrial units.
- Ensuring Aviral and Nirmal Dhara in the Ganga, Yamuna, and other rivers.

Forestry

- Increasing the forest cover to 33.3 per cent of the geographical area, as envisaged in the National Forest Policy, 1988.
- Improving the quality of existing forests.

Figure 1: Strategies for achieving sustainable environment

- Encouraging Farm Forestry.

Carbon Cycle

In the atmosphere, carbon is attached to some oxygen in a gas called carbon dioxide. Plants use carbon dioxide and sunlight to make their own food and grow. The carbon becomes part of the plant. Plants that die and are buried may turn into fossil fuels made of carbon like coal and oil

over millions of years. Carbon moves from fossil fuels to the atmosphere when fuels are burned. When humans burn fossil fuels to power factories, power plants, cars and trucks, most of the carbon quickly enters the atmosphere as carbon dioxide gas. Each year, five and a half billion tons of carbon is released by burning fossil fuels. The Earth self-regulates its temperature by a mechanism called the carbon dioxide cycle or the CO_2 cycle for short. If Earthwarms up a bit, then carbonate minerals form in the oceans at a higher rate. If Earth cools a bit, carbonate minerals form more slowly in the oceans. Plants use carbon dioxide in the environment and sunlight to make their own food and grow. The carbon becomes part of the plant. Plants that die and are buried may turn into fossil fuels made of carbon like coal and oil over millions of years. With

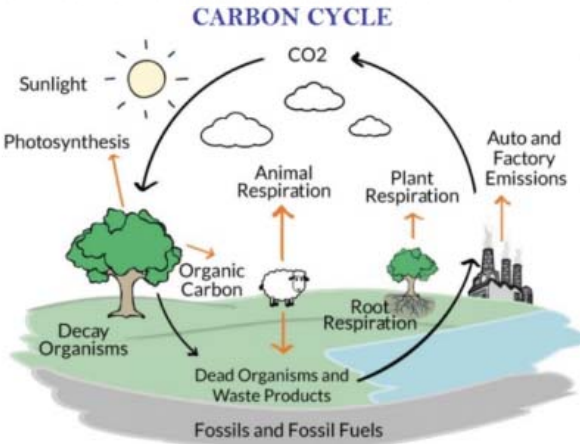

Figure 2: Carbon Cycle

the increase in carbon in environment because of various activities, it is thus imperative to grow more plants and trees.

Energy Cycle in ecosystem

Energy Flow in Ecosystem. Energy moves life. The cycle of energy is based on the flow of energy through different tropic levels in an ecosystem. Our ecosystem is maintained by the cycling energy and nutrients obtained from different external sources. Organisms use sugar as a source of energy to do work. All living things require energy to do the work necessary for survival and reproduction. This is true for bacteria, plants, and animals. On Earth, energy ultimately comes from the sun. They collect energy from the sun and use carbon dioxide and water in the process called photosynthesis to produce sugars. Animals can make use of the sugars provided by the plants in their own cellular energy factories, the mitochondria. The energy cycle for life is fuelled by the Sun.

Energy does not cycle the way nutrients and atoms do.Energy enters the ecosystem from the Sun and exits after the organisms have taken as much as they need. Organisms release energy back into the biosphere as heat. Energy also enters the ecosystem from the interior of the Earth.

Combustion Process

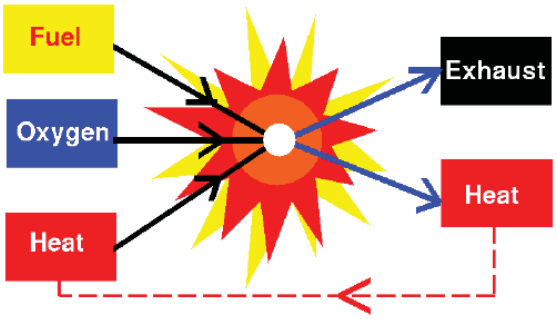

Figure 3: Combustion Process

Three things that must be present for combustion to occur are a fuel to be burned, a source of oxygen, and a source of heat. As a result of combustion, exhausts are created and heat is released. One can control or stop the combustion process by controlling the amount of the fuel available, the amount of oxygen available, or the source of heat.

Greenhouse effect

Greenhouse gases cause the greenhouse effect. Water vapour (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), and ozone (O3) are the primary greenhouse gases in the Earth's atmosphere. There are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine and bromine containing substances, dealt with under the Montreal Protocol. Beside CO2, N2O and CH4, the Kyoto Protocol deals with the greenhouse gases sulphur (SF6), hydro fluorocarbons (HFCs) and perfluorocarbons (PFCs). Without greenhouse gases, the average temperature of Earth's surface would be about −18 °C (0 °F), rather than the present average of 15 °C (59 °F).Wildfires, in turn, lead to deforestation. Since trees absorb much of the excess carbon dioxide in the atmosphere, fewer trees mean higher levels of greenhouse gases in the atmosphere—thus perpetuating the cycle in which warmer temperatures wreak atmospheric havoc. Global warming can also cause abnormally heavy rains.

Carbon cycle

The carbon cycle is the biogeochemicalcycle by which carbon is exchanged among the biosphere, pedosphere, geosphere, hydrosphere, and atmosphere of the Earth. Carbon is the main component of biological compounds as well as a major component of many minerals such as limestone. Along with the nitrogen cycle and the water cycle, the carbon cycle comprises a sequence of events that are key to make Earth capable of sustaining life. It describes the movement of carbon as it is recycled and reused throughout the biosphere, as well as long-term processes of carbon sequestration to

UN Climate Action Summit 2019

Global emissions are reaching record levels and show no

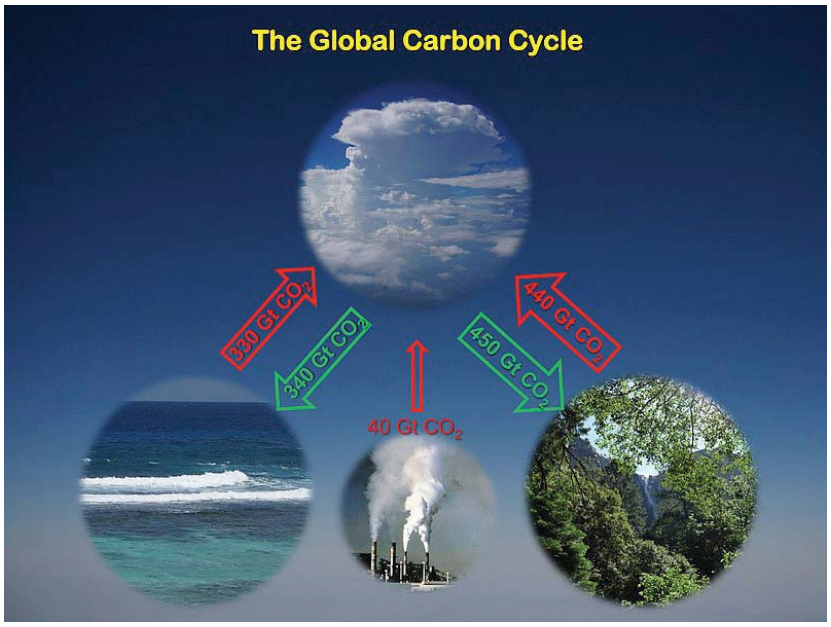

Figure 4: Global Carbon Cycle

sign of peaking. The last four years were the four hottest on record, and winter temperatures in the Arctic have risen by 3 °C since 1990. Sea levels are rising, coral reefs are dying, and we are starting to see the life-threatening impact of climate change on health, through air pollution, heatwaves and risks to food security.The impacts of climate change are being felt everywhere and are having very real consequences on people's lives. Climate change is disrupting national economies.

As per the latest analysis, if judicious action is taken at this stage, carbon emissions can be reduced within 12 years and the increase in the global average temperature to well below 2 °C can be held and even, as asked by the latest science, to 1.5 °C above pre-industrial levels. UN Secretary-General Mr. António Guterres is calling on all leaders to come to New York on 23rd September 2019 with concrete, realistic plans to enhance their nationally determined contributions by 2020, in line with reducing greenhouse gas emissions by 45 per cent over the next decade, and to net zero emissions by 2050. The Summit will bring together governments, the private sector, civil society, local authorities and other international organizations to develop ambitious solutions in six areas: a global transition to renewable energy; sustainable and resilient infrastructures and cities; sustainable agriculture and management of forests and oceans; resilience and adaptation to climate impacts; and alignment of public and private finance with a net zero economy.

In order to ensure that the transformative actions in the real economy are as impactful as possible, the UN Secretary-General has prioritized the following action portfolios, which are recognized as having high potential to curb greenhouse gas emissions and increased global action on adaptation and resilience. One of these tracks or focus areas is industry, which is led by India and Sweden, supported by the World Economic Forum (WEF).

- Finance: Mobilizing public and private sources of finance to drive decarbonisation of all priority sectors and advance resilience;
- Energy Transition: Accelerating the shift away from fossil fuels and towards renewable energy, as well as making significant gains in energy efficiency;
- Industry Transition: Transforming industries such as Oil and Gas, Steel, Cement, Chemicals and Information Technology;
- Nature-Based Solutions: Reducing emissions, increasing sink capacity and enhancing resilience within and across forestry, agriculture, oceans and food systems, including through biodiversity conservation, leveraging supply chains and technology;
- Cities and Local Action: Advancing mitigation and resilience at urban and local levels, with a focus on new commitments on low-emission buildings, mass transport and urban infrastructure; and resilience for the urban poor;
- Resilience and Adaptation: Advancing global efforts to address and manage the impacts and risks of climate change, particularly in those communities and nations most vulnerable.

Figure 5: Action Portfolios

In addition, there are three additional key areas:

- Mitigation Strategy: To generate momentum for ambitious Nationally Determined Contributions (NDCs) and long-term strategies to achieve the goals of the Paris Agreement.
- Youth Engagement and Public Mobilization: To mobilize people worldwide to take action on climate change and ensure that young people are integrated and represented across all aspects of the Summit, including the six transformational areas.
- Social and Political Drivers: To advance commitments in areas that affect people's well-being, such as reducing air pollution, generating decent jobs, and strengthening climate adaptation strategies and protect workers and vulnerable groups.

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