

SUSTAINABLE DEVELOPMENT: A PARADIGM FOR ENHANCING ENVIRONMENTAL QUALITY AND HUMAN HEALTH

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ABSTRACT

"Sustainable Development: A Paradigm for Enriching Environmental Quality and Human Health" explores the crucial intersection between environmental well-being and human health. This abstract highlights the imperative shift towards sustainable practices, emphasizing their role in fostering a harmonious coexistence between nature and society. By adopting eco-friendly policies and promoting responsible resource management, sustainable development emerges as a transformative framework. This paradigm not only safeguards the environment but also enhances human health, promoting a holistic approach to societal progress. The abstract underscores the pivotal role of sustainable development in creating a resilient future where environmental quality and human health thrive in tandem.

Keywords: Sustainable Development, Environment, Health

1. INTRODUCTION

Humans cannot exist without the natural environment, and as such, interactions between humans and the environment are inextricably linked. In order to meet the demands of the environment and people both now and in the future, it is crucial to research the effects of resource use and the best ways to manage them. The way that humans interact with the physical world has changed Earth system processes more and more. Historically, communities have been impacted and frequently disrupted by climate anomalies and other natural and man-made environmental change processes. Even while transient impact events are brief, they can have a big long-term effect on civilization, especially if they happen in the middle of a prolonged environmental change. Significant climatic events have the potential to impact human activity at pivotal moments that influence specific social development trajectories. Growth in human activities is rarely abruptly stopped when they get close to or beyond the capacity of the environment to support them. Instead, those who are thus involved are abruptly faced with a series of trade-offs in the distribution of resources among conflicting users and uses. These trade-offs are getting harder and harder to figure out from an ethical and practical standpoint. They involve our oldest conflicts (between personal and collective interests, for example), our highest aspirations (such providing a successful future for our children), and occasionally our most violent impulses.

2. THE EARTH'S ENVIRONMENT

The ecosystem on Earth is always changing. In reaction to these and many other factors that act on our planet, continents drift, mountains are thrust upward and erode, animal and plant species evolve, terrestrial and marine ecosystems change, the Earth's orbit around the Sun fluctuates, and the atmosphere and oceans adapt. These kinds of significant alterations usually happen gradually and are caused by powerful natural forces outside the realm of human influence or control. However, natural changes have been relatively minimal over the course of decades to centuries, at least for the several thousand years preceding the commencement of large-scale industrial and agricultural operations. Nowadays, humans could significantly alter the environment, at least initially over periods of decades to centuries. The Industrial and Agrarian Revolutions have changed the chemistry of our environment. Construction and agriculture have had a significant impact on coastal contours, sediment loading in rivers, and soil erosion. The distribution and health of living organism populations have been impacted by changes in land use and management, harmful chemical production and release, and land use changes. The world's continents' natural patterns of river flow, evaporation, and water storage have been impacted by the development of water resources.

In the future, people will likely play an ever more major role as agents of environmental change due to the growing global economy, population growth, and technological advancements. Fossil fuel consumption is altering the composition of the atmosphere and contributing to global warming. Climate change is also influenced by specific farming practices and the degradation of forests. These factors alter the composition of the atmosphere. Land use changes affect the land's capacity to deliver ecological services, such as wildlife habitat and water purification. Decades will pass before the stratosphere's ozone layer is restored due to emissions of CFCs and other chemicals containing chlorine and bromine. Changes in the global environment are being brought about by all of these reasons and more, and they may have far-reaching effects. The method for comprehending these alterations and their causes is scientific inquiry. The amount of scientific data that has been gathered over the past few decades suggests that a

variety of natural and human-related systems interact intricately to determine the rate, amplitude, and scope of environmental changes. Thus, a comprehensive understanding of all the constituents of what is now referred to as the Earth system is necessary to comprehend what is happening and what will happen in the future.

The structure of the planet is made up of the atmosphere, oceans, continents, living things, and areas covered in snow and ice. "Forcing agents" regulate the states of various constituents, resulting in modifications to the Earth system. A remarkable variety of physical, chemical, and biological processes connect the parts and transfer change throughout the system. While the majority of these are the result of natural processes, some are heavily impacted by human activity, such as land use changes that alter the land's cover and produce greenhouse gases. It is impossible to comprehend changes in any one aspect of the Earth's ecosystem by focusing only on that aspect's research. The Earth's climate, for instance, is influenced by a wide range of factors, including temperature, winds, and clouds in the atmosphere; the biosphere (living things and their surroundings); the composition of the atmosphere; the features of the Earth's orbit; the planet's reflective qualities; the distribution of water between the atmosphere, hydrosphere (oceans and freshwater), and cryosphere (snow and ice); and many more. Similar to this, a range of interaction phenomena are associated with other significant events, such as shifts in the productivity of the land or oceans or the frequency of volcanic eruptions.

ENVIRONMENTAL THREATS: HISTORICAL PERSPECTIVE AND OPPORTUNITIES

Every living thing aspires to survive and procreate. We think that we humans are the only sentient, emotional, intelligent creatures on the globe because of our ignorance of nature and general haughtiness. Because of our reliance on technology, we mistakenly believe that we are completely safe while, in reality, we are not. In the end, our world is quite dangerous. The United Nations reports that the earth is becoming more and more dangerous. Between 1994 and 2003, floods, earthquakes, storms, and other natural catastrophes affected nearly 2.5 billion people, a 60% increase over the two preceding 10-year periods. These figures exclude the millions of individuals who were forced to flee their homes due to the December 2004 tsunami, which killed an estimated 180,000 people as its enormous waves tore across coastlines from the Aceh province of Indonesia to India, Sri Lanka, and other places. 2004 was the most expensive year ever for global insurers in terms of property loss, having paid out over \$40 billion due to natural disasters. In the 1970s, human settlements were only impacted by 11% of earthquakes. That shot up to 31% between 1993 and 2003, when there was an earthquake in Iran that claimed 26,000 lives, a country whose population had doubled since the 1970s. Our communities are being constructed in ways that are incompatible with the risks that nature presents. Complicated systems also encourage the compounding of complexity in their effects. Experts anticipate more. Most scientists agree that storms, floods, heat waves, and droughts will get worse as a result of global warming.

Our world needs to drastically alter, far more quickly and drastically than any civilization could ever hope to do on its own. Four times throughout human history have there been abrupt and drastic changes:

- (a) With the development of the axe, spear, and flint arrowhead around 30,000 years ago.
- (b) With the development of disastrous agriculture and animal domestication some 10,000 years ago.
- (c) With the development of modern science during the Renaissance.
- (d) With the development of automation throughout the Industrial Revolution.

The most serious environmental threats or potential roadblocks are those that have the potential to negatively impact many facets of society's ability to advance towards the normative goals of sustainability; they have cumulative or delayed effects that take time to manifest; they are difficult or irreversible to alter; or they have a notable potential to interact with one another to negatively impact the planet's life support systems. In most developed countries, the most pressing issues are air and water pollution; in most less developed countries, the most pressing issues are ozone depletion and climate change; in many less developed countries, the most pressing issues are disease outbreaks, droughts or floods, and the availability of local resources. The examination of common development challenges revealed that many of the issues still facing the field are at least as serious as they were ten years ago, despite some progress being made in each area (such as reducing fertility to improve the balance between population and resources, expanding opportunities for health and education, supplying water, air, and sanitation services in urban areas, expanding food production, reducing and reusing materials, using energy more efficiently, and implem Furthermore, the majority of research and decision-making about hazards has opted to categorise environmental disturbances and related human activities into relatively distinct groups, such as "acid rain," "soil erosion," and "fisheries depletion." However, a lot of the difficulties in achieving a sustainable transition are related to the interplay between once separate and distinct human and environmental activities. The environmental research community is already aware of the enormous scope of human biosphere alterations, which have drastically changed key aspects of the atmosphere,

oceans, and terrestrial systems. This community also understands that many of these developments represent grave risks to human welfare and that their rates and orientations are unsustainable. There are wide variations in the degree of knowledge of these conditions among those outside the environmental scientific community. As a result, although certain members of the public, government, and commercial sectors are extremely worried, others are not even convinced that there are significant environmental issues. Like this, certain nations have made drastic policy changes to address problems, but the likelihood of other nations following suit is still relatively low. All things considered, some issues—like specific types of tropospheric air pollution and stratospheric ozone depletion—are being handled quite well, while many others are barely being touched at all.

3. THREATS TO BIODIVERSITY

There has been a noticeable decline in biodiversity during the past century. Roughly one out of every eight known plant species face extinction, according to some studies. There is disagreement over figures, however some place the loss at as high as 1,40,000 species. This graphic shows that ecological practices are not sustainable because there are relatively few new species emerging year. Between the years 1000 and 2000 AD, human activity—specifically, the loss of plant and animal habitats—was the primary cause of many species' extinctions. Many experts agree that the pace of extinction of species is higher currently than it has ever been in human history, with extinction rates hundreds of times higher than the background rate. Human use of organic resources, particularly in relation to the degradation of tropical forests, is the primary cause of elevated rates of extinction. Even though much of the disappearing species are not food species, when their natural habitat is changed into grazing, crops, and orchards, their biomass is turned into food for humans. It is estimated that only a small number of species, including humans, cattle, and crops, account for more than 40% of Earth's biomass. These studies alert us to the fact that additional reductions in complexity will ultimately lead to the collapse of the global ecosystem since species extinctions cause an ecosystem's stability to decline. Several factors, including overcrowding, deforestation, pollution (air, water, and soil), and human-caused global warming or climate change, are causing biodiversity to disappear. Even though they are all caused by overpopulation, these elements have a combined.

4. INVENTION OF CIVILISATION

The transition of three million years ago's homo sapiens from hunter-gatherers to farmers and settlers was a traumatic one, and it unintentionally led to consequences of great suffering and misery and ecological stresses that today threaten the survival of all life on Earth, according to historians around the world who have begun to develop a credible, broader picture of human history. The beginning of civilization is when the "history" that we were taught in school began. We discovered that in order for civilization to flourish, individuals needed to live near to one another and collaborate well in order to do challenging new occupations. They have to develop new, abstract technical languages and command and control systems in order to achieve this. Three immediate effects resulted from crowding, compulsion, and the creation of very successful agricultural technologies:

- (a) High levels of physical and emotional stress (nature's way of signalling and dealing with overcrowding).
- (b) Excess food (which in turn led to exploding population, and even more crowding), and.
- (c) Paradoxically, recurring, and catastrophic shortages, as the new monoculture crops occasionally and spectacularly failed.

THE TRUTH ABOUT CIVILISATION: THE PROBLEM AND ITS ROOT CAUSE

The well-meaning reaction of civilization was a sudden and severe scarcity of food for humans. However, it required a great deal of artificial structures and controls to function and was not an instinctive way to live. All that we have power over, we are innately sensitive to and accountable for. In nature, one's own community is its own thing; what occurs outside is not one's concern. However, since we now rule the entire world as a "global community," we are unable to react appropriately or assume the corresponding responsibilities. Because of this, by the end of this century, we will have fourteen billion people living on a planet that requires eight Earths' worth of resources (assuming present rates of regrowth) only to support basic human needs. A world beset by catastrophic famines, epidemics, crop failures, cannibalism, nuclear, biological, and chemical wars, water rationing and desertification, economic depression, catastrophic terrorism, cascading weather disasters, and the decline of democracy, constitutional liberalism, and the rule of law as a direct result of this overcrowding and unsustainable consumption.

THE SOLUTION

Either the causes of overcrowding and unsustainable consumption must be addressed, or there must be direct solutions to these issues. Alternatively, we may accept that this world will eventually collapse (likely due to a novel, devastating

illness or a nuclear or biological war), and begin creating a post-apocalyptic society where those who survive will be able to continue their lives and maybe even learn from their mistakes. Throughout history, there have been four techniques to find solutions:

- (a) Innovative (brought about through invention of new technologies);
- (b) Social (brought about by changing a lot of people's minds);
- (c) Commercial/entrepreneurial (brought about by changing the rules by which the economy operates), and;
- (d) Political (brought about by changing laws and regulations).

Among the methods discussed above, innovation is the most straightforward since it doesn't necessitate broad public support, while political reform is the most difficult since it is the political system's very nature to uphold the status quo, which was intended to bring about the changes necessary to make civilization "work." Throughout human history, innovations have been the most successful and long-lasting. Radical solutions are necessary for revolutionary transformation; these are solutions that subvert, supplant, and ultimately demolish current technology, systems, concepts, and beliefs. However, they should signify audacious strides ahead, rather than sentimental retreats into an antiquated era that is unattainable or undesirable.

5. POLLUTION PREVENTION

Pollution prevention, or P2 as it is more widely known, is any action or plan that eliminates or minimises the use of toxic materials, conserves energy or water, and gets rid of (or minimises) the production of hazardous waste, air emissions, wastewater, and other pollutants, as well as non-productive output. The phrase "pollution prevention" refers to a group of methods designed to lower the quantity of pollution produced. It stands in stark contrast to the majority of pollution control tactics, which aim to control an irritant and lessen its negative effects on the environment. The goal of the pollution prevention strategy is to make a process more efficient in order to minimise the quantity of pollution that is produced. While most experts believe that the best course of action is to reduce sources, some also refer to recycling and reuse as pollution prevention. More specific subdisciplines of pollution avoidance include green chemistry and green design, which is often referred to as environmentally conscious design.

1. Pollution Prevention.

- Pollution prevention means "source reduction" but also includes "other practices that reduce or eliminate the creation of pollutants through :-
- Increased efficiency in the use of raw materials, energy, water, or other resources, or Protection of natural resources by conservation.

2. Source Reduction.

Source reduction may be defined as any practice which :-

- Reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and Reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants. Source reduction includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

As a result, pollution prevention and source reduction are practically equivalent. The former involves cutting back on the production of wastes and toxins at the source, which in turn lowers discharges into the environment that could endanger public health and the ecosystem. Pollution prevention, like source reduction, excludes waste treatment, in-process recycling, and combustion of wastes to recover energy.

Recycling isn't technically a preventive measure. Recycling, however, may significantly improve the environment and help preserve important resources. In-process recycling, on the other hand, refers to the practice of recycling materials straight back into the same process and is sometimes regarded as a means of preventing contamination.

6. RELATED CONCEPTS AND TERMINOLOGY

- **Pollution Prevention.** The phrase "pollution prevention" alone might signify different things to different people. Reducing or eliminating waste at its source through improved conservation methods, less-toxic material usage, production modifications, and material repurposing is known as pollution prevention. Controlling and managing the wastes that we could see became necessary in the 1970s due to the severe and obvious pollution issues with the air and water, as well as the growing concerns with the disposal of hazardous waste. The 1980s saw a rise in understanding of the pervasiveness and longevity of our waste problems due to the more subtle and diffuse sources of pollution and improved detection techniques. The idea of pollution prevention emerged as a strong

reaction to the threat of more contamination as a result of hard-to-control pollution sources and the realisation that environmental problems are worldwide in scope. A fundamental reorientation of the approach to pollution was called "pollution prevention," which aimed to stop issues before they started.

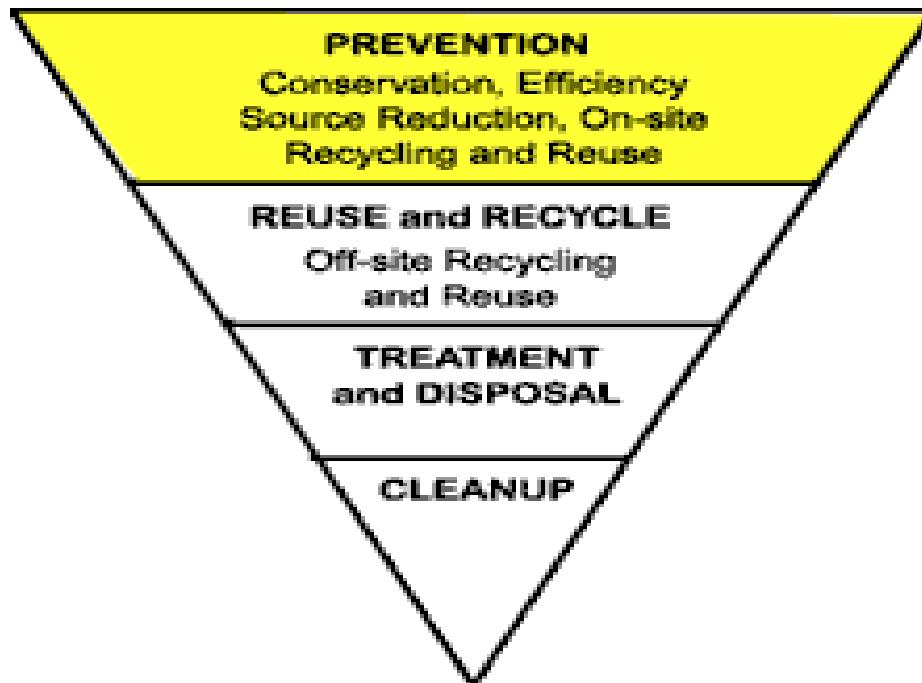
- **Waste Minimisation.** One of the earliest attempts at pollution control was waste minimization, which was primarily concerned with solid wastes, especially hazardous pollutants. Therefore, the current definition of pollution prevention, which focuses on reducing all forms of pollution and waste—including air emissions, releases into surface and ground waters, wasteful use of energy and materials, and waste (in the traditional sense) that is sent off for treatment, disposal on land, or off-site recycling—is far broader than waste minimization. Waste minimization has aroused controversy because, rather than concentrating only on reducing the quantity of waste produced at the source, it has frequently included treatment techniques to lessen the volume or toxicity of existing garbage.
- **Waste Reduction.** The concept of waste reduction lies in the middle between pollution prevention and waste minimization. Waste reduction, with its holistic approach to preventing all types of pollution emitted to all environmental media from products as well as from industrial processes, indicates a narrower perspective than pollution prevention, although having a broader focus than waste minimization. The phrase "waste reduction" is not often used, maybe because of its ambiguity.
- **Toxics Use Reduction.** Reducing the use of toxic substances in products or processes is known as "toxics use reduction." The goal is to limit negative impacts on ecosystems and the environment while lowering the risks to the health of consumers, workers, and the general public. Reducing the usage of toxics is categorised as source reduction. Substituting less hazardous materials for toxic chemicals in goods or procedures is known as "toxic chemical use substitution." It can also refer to initiatives aimed at minimising or doing away with the usage of chemicals or classes of hazardous materials by creating suitable alternatives or new technologies. Industrial pollution prevention is the combined result of source reduction and substitution of harmful chemicals.

The opportunities for source reduction are often not realised because existing regulations, and the industrial resources they require for compliance, focus upon treatment and disposal, rather than source reduction; existing regulations do not emphasise multi-media management of pollution; and businesses need information and technical assistance to overcome institutional barriers to the adoption of source reduction practices.

WASTE MANAGEMENT HIERARCHY

The "end-of-pipe" strategy—treating, controlling, and/or disposing of waste and pollution after it is generated—is a popular solution to these issues. This offers the least ideal method of waste management and frequently helps to shift pollutants from one media to another, improving the environment's quality without significantly increasing it overall. You may lessen the amount of waste and pollution you handle, recycle, treat, and dispose of by consuming, producing, and discarding less.

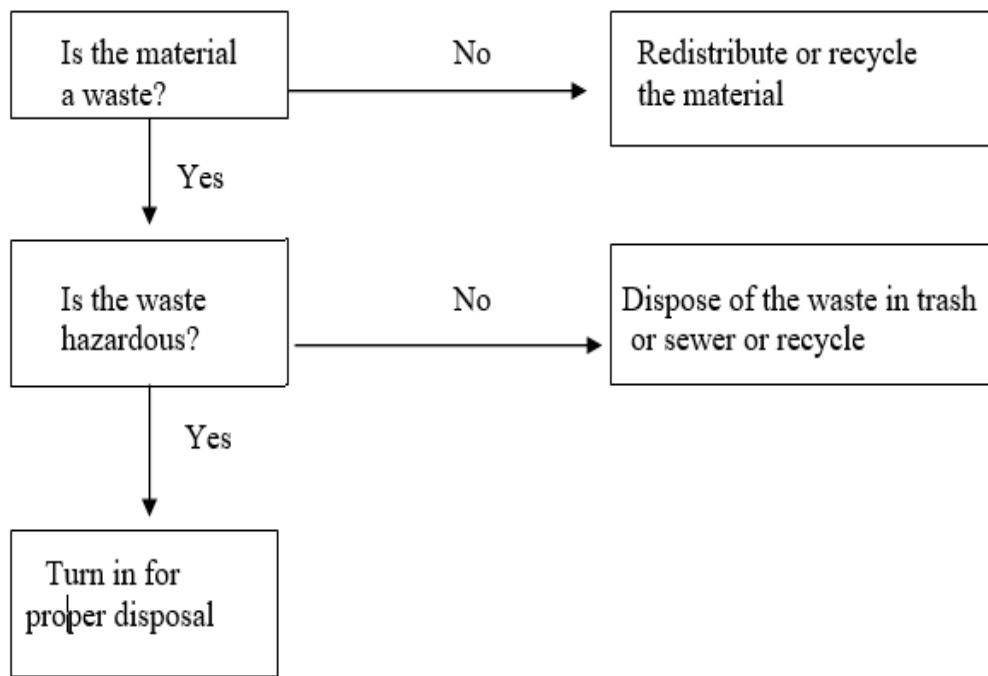
The pyramid below illustrates the best order of priorities for managing waste and non-product output:



Recycling, as previously mentioned, does not prevent pollution. Off-site reuse and recycling rank second in the waste management hierarchy if preventing contamination is not an option. Reusing and recycling an item still involves handling, energy use, and reprocessing even if it is generally preferable to discarding it in terms of environmental impact. To maximise resources and safeguard the environment, it is best to steer clear of the final two stages of the hierarchy: treatment, disposal, and clean-up/remediation. In order to prevent pollution, a scenario that generates waste or pollution must be carefully examined. Quality management and environmental tools must then be applied in order to implement and enhance whatever is causing the waste problem.

The hierarchy should not be interpreted as dictating an absolute that prevention is always the best course of action, but rather as defining a set of preferences. The hierarchy is used in a wide range of situations where decisions must be made.

WASTE DETERMINATION



KEY ENVIRONMENTAL ISSUES

Water Pollution. The key water pollution issues are set out as under:-

- **Salinisation of Fresh Waters.** The many impacts of excess salinisation on water resources include reduced crop yields, increased formation of scale and added corrosion in domestic and industrial water conveyance systems, as well as increased requirements for pre-treatment of water for selected industrial uses.
- **Enrichment of Fresh Water Bodies by Nutrients.** The accumulation of excess nutrients (e.g. phosphates and nitrates) in water bodies changes the composition and functioning of the natural biota, makes the environment less attractive for recreation and sport, causes the presence of toxic metabolites and taste and odour-causing compounds, and complicates water treatment.
- **Microbiological Quality of Water.** Human settlements are the major source of deteriorating microbiological water quality. Disease-causing micro-organisms and parasites enter the water environment through, for example, partially treated sewage effluents, seepage and wash-off from inadequate sanitation, etc.
- **Sediment and Silt Migration.** Many rivers carry a naturally high load of suspended solids, reflected in high turbidity. There are also many man-made sources of sediment and silt, which limit the light penetration of water, change natural productivity and affect the natural balance of predators and prey in biotic communities.
- **Harmful Inorganic and Organic Compounds.** Highly industrialised areas at times carry the burden of industrial pollution, including trace metals and synthetic organic pollutants. Concern is not only for the potable use of water (since these compounds are not easily removed by conventional water treatment technology), but also for the aquatic biota and the organisms indirectly dependent on aquatic life, such as waterfowl.
- **Diffuse Water Pollution.** Sources of serious diffuse water pollution include pit latrines, industrial seepage, agrochemicals in soil fertilisers and insecticides, run-off from farm lands, contamination from animal wastes, informal settlements, thermal pollution by power plants and leaking sewerage pipes.

Marine Pollution. The marine environment is impacted by off-shore exploitation of marine resources, offshore air-lifting operations, the extensive relocation of sand dunes in the near-shore area, oil spills from passing vessels, the seepage of sewage into coastal waters and sewage and industrial effluent discharge pipelines off the coast.

- **Air Pollution.** Sources of air pollution include pollution from mines, agriculture, domestic waste, industries, indoor emissions, vehicle emissions, crop spraying, smokers, low-grade coal, domestic cooking, burning of garden refuse and dust from roads. Common air pollutants and asbestos can have adverse health impacts if not managed.
- **Industrial and Domestic Fuel Combustion.** The highest levels of air pollution at ground level are found in rural townships, due to the use of coal stoves for cooking and heating. Larger municipalities have made significant progress in reducing air pollution in the city centres and the more affluent residential areas, but the increasing number of sources of pollution and rapid urbanisation are hindering progress.
- **Dust Problems.** Sources of dust include construction, agricultural and industrial activities and asbestos mining. Dust from untarred roads in a large number of rural villages and certain urban residential areas is a significant air pollution problem.
- **Vehicle Emissions.** Vehicle emissions from transport trucks and domestic vehicles contribute significantly to air pollution. Increasing dependence on private vehicle ownership and use exacerbates the problem.
- **Air Quality Management.** The significant deficiencies perceived in current air quality management include non-consideration of adequacy in planning and placement of industries vis-a-vis residential areas, poorly maintained and often non-operational monitoring equipment, control of emissions is based on source control, without reference to the receiving environment, lack of prosecution of offenders, lack of incentive for not polluting or for minimising pollution, need for air quality management to take account of the growing international concern about climate change and emphasis on reactive control, rather than proactive measures to manage air quality.
- **Noise Pollution.** Noise pollution (from traffic, construction, mining, commercial recreation and industrial activities) is viewed as an escalating problem and there is little practical means of recovering the situation in terms of current regulatory structures.

Land Pollution. Waste disposal sites, especially those containing hazardous, medical, and veterinarian waste, may result in land pollution problems. A few of the many other problem areas include the poor location and/or inadequate management of waste disposal sites, illegal waste disposal sites, lack of suitable hazardous waste disposal sites and poor town planning. Other major sources of land pollution include ; environmentally detrimental agricultural practices; the wood processing industry; waste treatment and disposal; repair shops and scrap yards; service stations; the metal industry and mining-related activities.

ENVIRONMENTAL POLICY

The previous 20 years have seen a rise in global worry over rising pollution, especially in the last ten years.

This is demonstrated by the numerous international conventions and protocols that have been established, as well as by the innumerable reports and meetings of important organisations, such as the 1992 Rio Conference, where 178 nations adopted Agenda 21 as a framework for sustainable development. The National Conservation Strategy and Policy Statement on Environment and Development (1992), the National Forest Policy (1988), and the Policy Statement on Abatement of Pollution (1992) comprise India's current national environmental policy.

Significantly, the Indian Supreme Court ruled that a key component of the sustainable development idea is the precautionary principle. Furthermore, "the State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country" is acknowledged as one of the Directive Principles of State Policy in the Indian Constitution. Despite not being explicitly stated as a basic right in the Indian Constitution, the Supreme Court of India has construed the right to life and personal liberty to include "the right to a wholesome environment." Thus, the government ought to strive for:

- Encourage the prevention and minimisation of waste generation, and thus pollution at source.
- Encourage the management and minimisation of the impact of unavoidable waste from its generation to its final disposal.
- Ensure the integrity and sustained "fitness for use" of all environmental media, i.e. air, water and land.
- Ensure that any pollution of the environment is remediated by holding the responsible parties accountable.
- Ensure environmental justice by integrating environmental considerations with the social, political and development needs and rights of all sectors, communities and individuals, and;
- Prosecute non-compliance with authorisations and legislation.

7. CONCLUSION

The previous emphasis on pollution impact management and remediation must give way to a management approach that combines source avoidance and waste minimization, impact management, and remediation as a last resort in order to achieve sustainable development. Effective pollution prevention emphasises the shared accountability of all societal sectors to safeguard the nation's natural resources, in addition to the installation of pollution abatement technology in industry. In addition to encouraging cost savings through efficiency and conservation, pollution prevention links to innovation in product design and production. It also places a strong emphasis on the responsible handling of persistent, large-accumulative, and dangerous substances and the elimination of their use when necessary. Policies and regulations, technical support, compliance monitoring, prioritising substances of concern, effective use and conservation of natural resources, reuse and recycling, operating efficiencies, economic incentives and disincentives, integrating environmental concerns into land-use planning and urban development, training, household waste minimization and recycling, product design, process changes, cleaner production, partnerships, life-cycle analysis, and developing strategies and tools to enable people to follow sustainable lifestyles are some of the general techniques that will be used to prevent pollution.

8. REFERENCES

- [1] Costanza, R., et al. (2017). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics*, 61(2-3), 267-276
- [2] Sachs, J. D. (2015). *The Age of Sustainable Development*. Columbia University Press.
- [3] Pretty, J. (2018). *The SAGE Handbook of Environment and Society*. SAGE Publications.
- [4] Steffen, W., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 1259855.
- [5] Haines, A., et al. (2019). Health and climate change: Policy responses to protect public health. *The Lancet*, 6736(19), 32464-6.
- [6] Leal Filho, W. (Ed.). (2018). *Handbook of Sustainability Science and Research*. Springer.
- [7] Rockström, J., et al. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472-475.
- [8] United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly on 25 September 2015.
- [9] World Commission on Environment and Development. (1987). *Our Common Future*. Oxford University Pres.