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Table of Content

Withania somnifera: Unveiling Its Medicinal Wonders- A Comprehensive Review

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Abstract

Withania somnifera is a multipurpose herb with a long history of use in traditional medicine. It is a Rasayana of ayurvedic system of medicines. This review delves into the therapeutic potential of *W. somnifera*, covering its phytochemical constituents, pharmacological activity, and diverse applications in enhancing overall health and well being.

Keywords: Ashwagandha, Phytochemistry, Health, Chemical constituent.

Introduction

In recent years traditional and ancient herbs have gained worldwide attention for their medicinal impacts on our well-being. One such herb is *Withania somnifera* (Ashwagandha). Ashwagandha is one of the best Ayurvedic herbs and holds a place in the Ayurvedic traditions similar to Ginseng in Chinese therapies. It has often been referred to as the "Indian Ginseng"[1]. Amongst the other synonyms for *Withania somnifera* are Ashwagandha (Bengali), winter cherry (English), Asgand (Punjabi) and chirpotan (Rajasthan). It is a green shrub found throughout the drier parts of India, Baluchistan, Pakistan, Afghanistan, Sri Lanka, Congo, South Africa, Egypt, Morocco and Jordan[2]. In Sanskrit Ashwagandha means "Horse's smell", because fresh roots of the herb smells like horse. There is also a belief that anyone who consumes the herb is given the power and strength of a horse [3-5]. In Ayurveda, it holds a significant position as a prominent herbal Rasayana and is recognized by the name "Sattvic Kapha Rasayana" [6]. Across the annals of history, it has consistently been regarded as one of the best health tonics and restorative agents employed to address general conditions such as general debility, exhaustion, stress induced fatigue and insomnia [1].

Taxonomic classification

Kingdom- Plantae, Plants
Sun-Kingdom- Tracheobionta, Vascular Plants
SuperDivision- Spermatophyta, Seed plants
Division- Angiospermae
Class- Dicotyledons
Order- Tubiflorae
Family- Solanaceae
Genus- *Withania*
Species- *somnifera*

Chemical Constituents

The chemical composition of Ashwagandha is rich and diverse, with several key constituents that contribute to its therapeutic effects. Over 12 alkaloids, along with 40 withanolides and numerous sitoindosides, have been identified and

Basic Principles of Indian Knowledge System of Medicine-Ayurveda

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Abstract

In India the ayurvedic concept appeared and developed between 2500 and 500 BC. The meaning of Ayurveda is "Science of Life", because ancient Indian system of healthcare focused on views of man and his illness. The basic principles of Ayurveda gave a concept that the universe is composed of five elements: space, air, fire, water and earth. They combine to form three doshas or energies: vata, pitta and kapha. Ayurveda translates as the "Science of Life", and it addresses all aspects of life including consciousness, physiology, behavior and environment. It primary focuses on prevention of disease and maintenance of health.

Keywords: Ayurveda, principles, Indian knowledge system, medicine.

Introduction

Ayurveda has been considered as one of the oldest of the traditional systems of drug and it's accepted worldwide. It is one of the most framed traditional systems of medicine that has survived and flourished from periods till date. Ayurveda is a life wisdom deduced from experience. It emphasizes that human health requires both sustained medicine and holistic approach. Ayurveda also known as the "science of longevity" because it offers a complete system to live a long healthy life. It offers programs to rejuvenate the body through diet and nutrition and also the treatment style to cure numerous common diseases similar as food allergies, which have few modern treatments. It has been pointed out that the positive health means metabolically well-balanced human beings [1]. The basic theories of Indian medicine are the five elements theory and the three humoralisms theory. In vedic culture the five elements theory is a natural philosophy and it is used in medicine to explain human physiology.

Panchamahabhoota

According to Ayurveda the entire universe is composed of five elements. The five elements theory presents that in the world everything is composed of five basic elements i.e. Prithvi (earth), Jala (water), Agni (fire), Vayu (air), and Akasha (ether). These supplement the corresponding elements in the human body after being ingested. These five elements referred to as Pancha mahabhoota and form the three basic humors of human body in varying combinations. [2-4]. These minutest elements, constitute living and non-living matters. In this whole world, everything, such as drugs, herbs and living beings are made of these basic elements. Every matter contains all of these five elements. The matter is classified as Parthiva, Apya, Taijasa, Vayaviya and Akashiya(With predominance of earth, water, fire, air and space respectively). The permutation and combination of these elements and its

The Indian Traditional Knowledge of Some Medicinal Plants and their Role In Combating Covid and Other Viral Diseases

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Abstract

The Covid-19 pandemic had devastated human health & the economy throughout the world. Each and every sector was affected by the varsities of COVID-19 implications. The nations were trying to make the best vaccines to combat the virus. The vaccines like covishield, covaccine & Sputnik –V reached out to most states & most of the citizens of our country. But still there are many Indian traditional medicines mentioned in our ancient Vedas that can effectively cure such viral diseases. Even homeopathy has medicine for curing covid-19 disease. Doing Yoga has positive effects on increasing oxygen levels in our body. There were many incidences in the scenario of the coronavirus pandemic wherein people 100% cured themselves of the deadly coronavirus by simple medicinal intake of some plants extracts of *Azadirachta indica, Withania somnifera, Ocimum sanctum* etc. to name a few.

This paper deals with the Indian traditional knowledge of medical applications and usage of the plants especially with control of the deadly coronavirus which is very important in the present scenario with the discovery of the recent JN.1 and HV.1 strain of coronavirus.

Keywords: Coronavirus, COVID-19, viral diseases, Traditional medicinal plants

Introduction

Since December 2019, a novel Coronavirus (2019-nCoV) with the unusual property of transferring severe illness from person to person was found in Wuhan, a small town in China. It spread quickly and infected a large number of individuals in China and other nations in a short amount of time. Since 2019 the Coronavirus has changed many forms as a result of mutation and is still persistent in the form of present day JN.1 and HV.1 strain. When the entire globe was battling COVID-19, a respiratory illness caused by the novel Coronavirus, there developed a strong need to investigate the efficacy of complementary and alternative medicine as a preventative strategy [1].

Coronaviruses, CoVs are members of the Nidovirales family (order: Nidovirales). Coronavirina is a family of Coronaviridae viruses. Coronaviruses are further subdivided into, ß, and Coronaviruses. CoVs are encased in a 125-nm-diameter shell. The corona is named from the club-shaped spikes that protrude from the virion's surface and resemble the solar corona. The envelope's nucleocapsid is helically symmetrical and includes 30 kb of non-segmented, positive- sense RNA. They bind to host cells by their envelope spike proteins and enter to multiply before being released [2, 3]. The novel Coronavirus generally infects the lungs, nose, and throat causing respiratory infections like coughing, sneezing,

Applications of Nanotechnology: Agricultural perspective

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Abstract

Agriculture forms one of an important part of a country's economy, as it not only fulfills the food requirement of humans and animals but also adds to the economy of a country. Due to certain natural calamities, climatic variation, insect and pest attack, the agricultural production gets damaged. To overcome such damages and to satisfy the nutritional demands of the rapidly growing global population, some sustainable and innovative technologies are required. One such emerging technology is Nanotechnology. It has gained immense attention in the recent years due to its wide applications in several areas like medicine and has appeared as promising agents for the plant growth, fertilizers and pesticides. Nanotechnology has contributed to the improvement of agrotechnology by many nanoparticle-based formulations, like nano-sized pesticides, herbicides, fungicides and fertilizers. It has been widely investigated for plant health management and soil improvement.

This review highlights the nanotechnology based critical approach towards innovative agrotechnology which will not only be a step towards sustainable future initiative but also will promise a better future with food security and food productivity. The use of nanoparticles can be considered as an alternative solution to control plant diseases, pests and insects.

Keywords: Agriculture, nanoparticles, applications, nano-pesticides, nano-fertilizers

Introduction

Agriculture forms one of an important part of a country's economy, as it not only fulfills the food requirement of humans and animals but also adds to the economy of a country. Due to certain natural calamities, climatic variation, insect and pest attack, the agricultural production gets damaged. One of the reports by the United Nations recently predicted that the world population by 2050 would be approximately 9 billion [1]. So, to fulfill the food demand requirement of the ever increasing population food production needs to be enhanced. To overcome such damages and to satisfy the nutritional demands of the rapidly growing global population, some sustainable and innovative technologies are required. One such emerging technology is Nanotechnology. It has gained immense attention in the recent years due to its wide applications in several areas like medicine and has appeared as promising agents for the plant growth, fertilizers and pesticides. Nanotechnology has contributed to the improvement of agrotechnology by many nanoparticle-based formulations, like nano-sized pesticides, herbicides, fungicides and fertilizers. It has been widely investigated for plant health management and soil improvement. Nanoparticles are highly reactive owing to

Curriculum Integration: Pros and Cons

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Abstract:

The idea of an interdisciplinary approach is that students learn more than the immediate course content. The aim is to combine two or more disciplines into one activity to achieve learning objectives for that discipline. Learn interdisciplinary skills, including thinking and research skills that are integrated across all disciplines. It is the integration of different disciplines within the same unit to study a concept.

Keywords: Interdisciplinary, skills, integrated, concept, thinking.

Introduction

Integration is that it merges contents or pedagogies traditionally occurring in one discipline with those in other disciplines in an effort to facilitate student learning. Inclusive learning helps students adapt to the rapidly changing needs of the workplace and helps learners develop transferable skills needed for success after graduation. In the classroom, integrated learning helps students gain a deeper understanding and appreciation of their subject areas. Different integration approaches include interdisciplinary integration, interdisciplinary integration, and interdisciplinary integration.

Multidisciplinary Integration: Teachers using this method focus primarily on their area of expertise. They use a central theme and select standards from each subject to support that theme. For example, a unit that focuses on geocaching and meets standards in math, language arts, and science would be interdisciplinary.

Interdisciplinary Integration: Interdisciplinary approaches support standards for different subcategories within a subject area. For example, units that integrate reading, writing, and oral communication will be interdisciplinary. Another example could be a unit that integrates history, economics, and geography.

Interdisciplinary Integration: The interdisciplinary approach is structured around student questions and real-world topics. A common example of an interdisciplinary curriculum is problem-based learning.

Each of these categories has a different organizational focus and is influenced by different ways of thinking about how best to acquire knowledge. This helps students understand the concepts, maintain interest in the topic, and relate different topics to each other. Integrated teaching also promotes critical and creative thinking, self-cognition, learning and cooperation skills, and cultural understanding. An integrated curriculum removes traditional subject boundaries and relies on unifying concepts and integrated learning to connect different areas of learning. They can be interdisciplinary. Contains multiple or interdisciplinary subjects. Multiple topics of the same subject are integrated.

BALANCED DIET

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Abstract

A balanced diet is crucial for optimal health and well-being. It comprises of right amo of foods from all food groups. This ensures provision of all essential nutrients macronutrients and micronutrients. Inclusion of diverse variety of local and seasonal fo is a key to ensure this balance. A sound nutritional profile will help an individual to pro against or delay the onset of non-communicable diseases (diabetes, cardiovas diseases, arthritis, and cancer) and enhance immunity to fight against communi diseases. Physical health lays foundation of sound mental, emotional, social and spir health.

Keywords: Health, nutrients, diet, food.

Introduction

'Balance is the key to life' and food is essential for life. Therefore, a balanced diet is a key to healthy and happy life. Now how to use this key to unlock the secrets of health and longevity is still a puzzle for most of us. So to solve this puzzle one must understand some basic concepts. These are as follows:

- Definition of Balanced diet
- Tools to Ensure Balanced Diet
  - **a. Quantitative:**
    1. Recommended Dietary Allowances
    2. Nutrient Composition of Food
    3. Portion size
  - **b. Qualitative**
    1. Food pyramid
    2. Types of food based on function
    3. Food group system: Dietary diversity.

Balanced diet is one which provides all nutrients in adequate amount and in proper portions. To maintain this balance is difficult as there are many factors responsible, which affect the nutrient requirements of individuals. These fa are:

- **Age:** When a child is born, hi growth is at peak. Body tissues organs are growing fast and develo in both structural and functional asp The nutrient requirement at this a higher than that of adults. Gradually growth spurt slows down. Then the enters into adolescence which is ag stage of rapid develop Physiological needs of nutrients are high again. By the age of 18-20 year physical growth is optimum and nut requirements are lesser as compare that of a child, on per kilogram b weight basis. After 30 years of nutrient requirements slow down degeneration starts which we 'ageing'.
- **Gender:** Males have higher lean b mass as compared to females therefore, their requirements for mo the nutrients are higher than fem

A Review on Zinc Oxide: Structure, Synthesis and Applications

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Abstract

In present scenario there is need of a material that has effective electronic, thermal and optoelectronic properties for different kind of application like solar cells, photoluminescence devices, field effect transistors and semiconductors, etc. Today Zinc Oxide nanoparticles gained high attention in the field of material science, agricultural, and food industry. This review extensively focused on structure, various synthesis methods for preparing ZnO nanoparticles and thin films.

Keywords: ZnO, Synthesis, Application

Introduction

In present protection of earth by harmful UV radiation is the biggest challenge in the field of textile industries. Ultraviolet radiation penetrates from the sun to the earth in the form of energy which has 50% percent visible light, 45%percent infrared, and 5%ultraviolet radiation [1]. UV radiation can be classified into three wavelength regions based on its wavelength: UVA (400 nm-320 nm), UV-B (320 nm-280 nm) and UV-C (280 nm–200 nm) [2].

In the present time, the ozone layer has completely absorbed UV-C.]. From all three UV-A and UV-B are the most damaging radiation. It has high energy and a short wavelength [3]. In order to reduce such effects, ZnO nanoparticles must be synthesized for textiles industries. Basically there are three types of structure of ZnO, that is, Cubic rock salt, cubic zinc blende, and hexagonal. Zinc oxide nanoparticles are one of the nanomaterial inorganic compounds that have unique physical and chemical properties. It possesses high chemical stability, radiation absorption spectrum, high electrocoupling coefficient and high photostability [4].

ZnO NPs have a number of great qualities like easy to synthesis, flexible in shape and size, nontoxicity, the existence of extrinsic and intrinsic at the emission centre, and the ability to emit a variety of lights (violet, blue, green, yellow, and red) [5-7].

ZnO nanostructures have been subject of immense due to its multi functional properties in diverse applications. zinc is an essential and important element which is found in the human bone, muscle, skin and in tissues of tooth. Nanosized ZnO particles show high significance in the field of bioscience, due to its nano size it can stimulate different bactericidal mechanisms once inside the bacterial cell [8-9]. The most important application of ZnO nanoparticles would be as antibacterial agents. ZnO-NPs exhibit antibacterial properties due to increased specific surface area as the reduced particle size area as the reduced particle size enhanced reactivity of surface area. It is also a biosafe material that has photo-oxidizing and photocatalysis impacts on chemical and biological species [10]. Recently, Zinc oxide nanoparticles have been an active research area in field

A Review on Telluride based Thermoelectric Materials

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Abstract

Now-a-days there is a requirement of a material which is cost effective and efficiently used for energy generation. In recent years Bismuth Telluride (BT) and Antimony Telluride (AT) have attracted great attention from researchers due to their thermoelectric properties. BT & AT are topological insulators, that is a unique property of theirs due to this they are using in regenerator cooler, chip sensor, solar cells and other field of material science. Deposition of thin film in micro scale systems provides advantages like size, flexibility and weight for many applications. In this manuscript a review of BT and AT is present where it contains different synthesis methods, various physical properties and their application in many areas.

Keywords: Bismuth Telluride, Antimony Telluride, Thermoelectric.

Introduction

Global warming is becoming a very big issue in the current scenario. There is a big need to develop new materials which have potential for the harvesting of energy. Several Technologies have been adopted but among these, thermoelectric technology has made enormous advances. Thermoelectric devices have the potential to convert any type of waste heat generated by vehicles, solar, radar etc. into electricity. These devices have heating and cooling applications used in generators and refrigerators without any use of other devices like mechanical pumps or fans. There is a great demand for these devices but the uses of these devices are less due to high cost and low efficiency. Researchers are trying to develop new materials of low cost and high efficiency. The efficiency of TE devices depend on dimensionless quantity termed as Figure of Merit (ZT) = $S2\sigma/k$, where S is seebeck coefficient, σ is electrical conductivity and k is the thermal conductivity. Higher value of ZT leads to higher efficiency. To increase the value of ZT, the value of S and σ must be high with relatively lowering the value of k. The thermal conductivity of a material is given by $k = ke + kL$, where ke is the thermal conductivity due to the electronic part which is related to electrical conductivity and the relation given by Wiedemann-Franz Law $ke = LT\sigma$, where L is the Lorenz no. It can be easily seen that the electronic part of thermal conductivity is directly related to the electrical conductivity. So, if someone tries to lower the thermal conductivity part, electrical conductivity is also reduced which also lowers the value of ZT of TE materials. So, most of the research is on lowering the kL, part which is due to thermal conductivity due to the lattice part. This can be done by superlattice structures.

TE materials have been divided into three categories which show best thermoelectric

Development of Artificial Human Phantoms used in the Testing purpose of Microwave instruments having close proximity with the Human Body- A Review

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Abstract

The rapid evolution of communication technology has enabled the transmission of intricate biological data from the human body to external intensive care systems, facilitating the detection of various ailments. Cutting-edge research in biotelemetry and microwave imaging systems has leveraged microwave devices to electromagnetically interface with the human body. However, direct application of these devices on human subjects is impractical and potentially hazardous, necessitating rigorous testing in controlled environments using human phantoms. These simulated environments ensure the system's performance across diverse scenarios while prioritizing the safety of individuals. For instance, breast imaging systems, crucial for detecting tumors, demand rigorous testing on breast phantoms to optimize design and algorithms prior to clinical trials. Moreover, experiments such as specific absorption rate (SAR) and hyperthermia, vital for monitoring power intensity and tissue temperature variations, cannot be conducted on humans, underscoring the importance of artificial human body replicas in material research and development. This review provides an insight into the materials commonly employed to simulate human physiology, outlining the advancements in artificial human body replicas vital for validating microwave instruments efficacy in disease detection before clinical deployment.

Keywords: Human Phantoms, Microwave Imaging, Breast Imaging Systems

Introduction

Creating an artificial counterpart that faithfully replicates a human organ or tissue demands a meticulously crafted phantom endowed with specific attributes: anatomical fidelity, precise dielectric characteristics spanning the desired frequency range, and enduring durability. Accurate representation of tissue layers within the phantom is imperative for authentic scenario analysis, particularly crucial for applications reliant on the body parts composition, such as implantable devices. The electrical traits of these phantoms are pivotal in mirroring real-world conditions, with their properties juxtaposed against those of actual tissues across the relevant frequency spectrum. Longevity is paramount for experimental reproducibility and sustained research endeavors, necessitating that the phantoms shape, tissue distribution, and dielectric properties remain steadfast over an extended duration. The electrical characteristics (permittivity, ε_r, and conductivity, σ) of human body tissues exhibit significant variability based on

A Comprehensive Review On Synthesis Methods And Diverse Applications Of Manganese Nanoparticles

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Abstract

One emerging and promising area of nanotechnology is nanobiotechnology. More focus has been placed at this field because of the necessity to develop substances that are biocompatible over the past few decades for a variety of uses in fields including health, medicine, water treatment and purification etc. In the contemporary era, a great deal of investigation has been done on the environmentally conscious production of different nanomaterials (NPs). This review draws the attention on the environmentally friendly synthesis, uses, and prospects of Manganese nanoparticles (MnNPs). Manganese is a high performance metal and has a wide range of fields encompassing water purification, electronics, electrochemistry, photoelectronics, biomedicine, and biosensors. There has been research and discussion on numerous ecologically sound methods for creating Mn NPs, including microbial synthesis, low temperatures synthesis, and plant based synthesis. Furthermore, a number of MnNP implementations have also been accomplished. The wide array of applications include countless medical applications like anti bacterial and antifungal activities , biological imaging and drug delivery methods. Along with medicinal applications it is also employed in environmental applications as well as in biosensors.

Keywords: Manganese , Nanoparticles , Nanobiotechnology , Environment friendly

Introduction

Due to nanotechnology's transformational ability to impact a wide range of industries, interest in the field has grown in recent decades [1,2]. Nanotechnology is becoming an increasingly popular area of study because of its extremely adaptable, modular, and efficient attributes. It deals with the manufacturing and storage of nanoparticles (NPs) for usage in a range of fields such as biological medicines, water distribution systems, sanitation and purification, engineering, optical technology, the pharmaceutical industry, skin care products and so on [3-7]. Two approaches are typically utilized for synthesis for NPs are: top-down and bottom-up [8]. When using a top-down technique, bulk materials are often converted into nanomaterials. However, when employing a bottom-up method, NPs are produced from molecules or atoms. For chemical synthesis and green synthesis of nanoparticles, the bottom-up method is typically employed [9].Green production of nanoparticles is an advanced technique derived from nanobiotechnology [10] and the primary goal of nanotechnology research is to create green nanomaterials.

Amongst several three-dimensional transition metal-oxides, oxides of Manganese have garnered particular scrutiny due to their plethora of

compositional and structural modifications. MnO , Mn_3O_4 , MnO_2 and Mn_2O_3 are different oxides of Manganese, and the nanoparticles of these oxides are highly intriguing for nanotechnology as they are ecologically friendly [11]. Furthermore, Mn-oxides are often slight hazardous substances in comparison to other compounds such as different chalcogenides, which are the foundation for NPs. They are also environmentally friendly, economical, and have a high unique capacitance.[11,12]

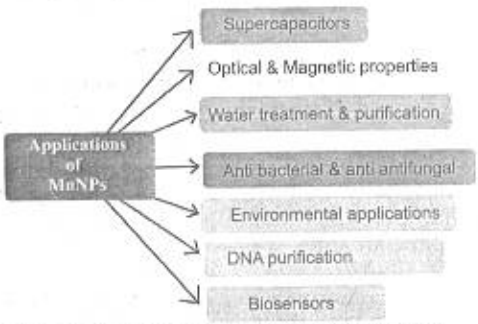

Fig 1 : Potential applications of MnNPs

Two of the biggest problems in nanobiotechnology today are controlling the size and formation of green synthesised MnNPs [13]. Green approaches are taken into consideration when synthesising MnNPs since they don't require stabilisation or reduction as a specific chemical and their creation can be carried out in mild settings like normal room temperature and ambient pressure conditions. [14] Utilizing vegetables, fruits, extracts of plants, microbes, fungus, and raw materials, the biological production of MnNPs produce Mn and Mn-oxide nanoparticles.

Few applications of MnNPs are depicted in fig 1.

- **Synthesis of MnNPs**

1. Green Methodology utilizing plant extract

The reaction is accomplished by mixing the plant extract with the metal salt solution at room temperature. In a short span of time, the constituents of plant extracts including polysaccharides, terpenoids, flavones, and phenolics, are utilized which are responsible for the metal reduction [15,16]. Manganese NPs have been synthesised using a variety of plant extracts so far. MnNPs with an average crystallite size of 50 nm were synthesised by using manganese acetate and lemon methanolic extract as reducing and stabilising agents, respectively. The pH was maintained between 3-4 and the temperature was maintained between 50 and 60 °C [17].

2. Green Methodology utilizing microorganisms

Metal nanoparticles (NPs) have been prepared using a wide array of microorganisms. Small-scale organisms possess several reductase enzymes that can convert metal salts into metal NPs with a narrow distribution of size and improved dispersity, and the ability to extract and collect heavy metals [18]. In a piece of work, with an average size of 80 nm and a yield of 4.5 (g/l), $Mn_{0.6}Fe_{2.4}O_4$ magnetic NPs were produced in a huge quantity using Thermoanaerobacter sp. TOR-39. 10 mM glucose was mixed every four hours to the mixture during the three weeks and incubation was maintained at 65°C. The pH of 7.2–7.5 was maintained and the mixture was kept anaerobic and CO_2 gas was abducted in the headspace during the incubation period by constant purging with N_2. Every 30 minutes, vigorous mixing was done while the contents were continually agitated at 40 rpm.[19]

- **Applications of Mn and Mn-Oxide NPs**

1. Antibacterial and Antifungal activity

The ability of nanoparticles MnNPs to form extremely susceptible oxygen species (OH^-, H_2O_2, and O_2^{2-}) on their surface has been used to interpret their antifungal and

Sustainability: An Interdisciplinary Approach

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Abstract

The Industrial Revolution marked a significant shift in production methods by utilizing mechanical energy derived from fuel. This focus on increased production for improved living standards, however, led to various forms of concentrated pollution and their adverse impacts on humans, animals, and the environment. This raised the debate on the balance between development and environmental protection. Initially, efforts to address environmental degradation focused on engineering pollution control, but increasing development demands led to the overexploitation of natural resources, affecting various aspects of the environmental ecosystem as a cost of progress.

Sustainability, distinguished from conservation, emphasizes maintaining ecosystem functions to provide ecosystem services within the ecosystem's carrying capacity. It evolved from various fields like industrial ecology, climate change science, and policy science.

The pillar model, triple-bottom-line model, and components of sustainability- frame sustainability science as an interdisciplinary field. Sustainability research involves addressing complex challenges such as climate change, biodiversity loss, and resource scarcity through integrative and transdisciplinary approaches to achieve sustainability goals. The integration of diverse knowledge and collaborative efforts across different fields are crucial in addressing multifaceted sustainability issues and shaping a sustainable future for all.

Keywords: Sustainability, interdisciplinary, ecosystem.

Introduction

Industrial revolution changed the production behaviour by employing the mechanical energy harnessed through the fuel derived energy. The prime focus of such development was on increased production with ease of living. This brought in the challenges in form of various types of concentrated pollution and their impact on humans, animals and the natural systems. This gave rise to the debate on dilemma of development versus environment protection. The initial responses begin by tackling the environmental degradation through the engineering control of pollution. However, increasing developmental aspirations propelled for indiscriminate exploitation of natural resources and consumption thereof. This led to many facets of environmental ecosystem becoming impacted as cost of development.

In that sense, sustainability means sustainability of the ecosystem's functions to provide the ecosystem services. It is not to be construed as conservation, where the objective is to preserve the ecosystem regardless of human purposes. Although

Detection Of Microplastics In Waste Water Treatment Plants Utilizing Current Techniques : A Review

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Abstract

Microplastics have aroused an increased concern as they pose threat to aquatic species as well as human beings. Many studies indicate that waste water treatment plays an important role in releasing microplastics to the environment. The key aspects regarding microplastics occurring in waste water treatment plants (WWTPs) such as concentration, total discharges, materials, shapes and sizes are summarized and compared. The development of potential microplastics targeted treatment technologies is also presented. All the previous researches in microplastics have undoubtedly improved the understanding around this worldwide challenge and hence, some important future research areas are being outline in this paper.

Keywords: Microplastic, waste-water, environment.

Introduction

According to the European Chemicals Agency and the US National Oceanic and Atmospheric Administration (NOAA), microplastics are pieces of any kind of plastics that are fewer than 5 millimeter (0.20 inch) in length .They enter naturally in environments through a range of channels such as food packagings, clothes ,cosmetics and industrial operations and this lead to pollution. The term micro plastics was introduced in 2004 by professor (Richard Thomson) a Marine biologist at the University of climate in the UK [1].

Micro plastics are now most common in our surroundings and it was estimated that there are between 15 and 51 trillion individual pieces of micro plastic in the world's ocean.

Two classifications of microplastics are currently recognized-

1. **Primary microplastics**
2. **Secondary microplastics**

Primary microplastics- Primary microplastics are small pieces of plastic that are purposefully manufactured and are usually used in facial cleansers, cosmetics etc. Primary microplastics have also been used in Airblasting technology, which involves blasting acrylic, melamine or polyester. Micro plastic `scrubbers` used in exfoliating hand cleanser and facial scrubs have replaced traditionally used natural ingredients. These scrubbers frequently get polluted with heavy metals including Cadmium, Chromium, and Lead, as a result of being used repeatedly until their size decreases and their cutting ability is lost. Even though a lot of businesses have made a commitment to lower their microbead manufacturing, a lot of bioplastic microplastics still have a lengthy degrading life cycle much like regular plastics. The US has stopped using

Role of Nanoparticles in Biomedical Field

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Abstract

Significant advancements in nanotechnology have fundamentally reshaped the role of nanoparticles (NPs) within both the scientific community and society at large. Nanomaterials, defined as materials possessing at least one dimension ranging from 1 to 100 nm, have become ubiquitous across various technological and scientific domains. From intricate electronics to cutting-edge medical therapies, nanoparticles feature prominently in a diverse array of applications and innovations. In the realm of medicine, there is a growing recognition of the profound impact of polymer-coated nanoparticles, owing to their exceptional physical, chemical, antibacterial, antimicrobial, and protective attributes. Of particular significance is their biomedical utility, facilitated by their nanoscale dimensions, which align with many biological molecules. Leveraging this alignment, these nanoparticles exhibit a myriad of crucial functionalities, including targeted drug delivery, imaging, photothermal therapy, and sensor capabilities. Furthermore, by fine-tuning properties at the nanoscale level, nanoparticles can be tailored to meet specific requirements within biomedical fields. This manipulation encompasses adjustments in electronic, optical, surface plasmon resonance, and physicochemical characteristics, thereby enhancing their suitability for diverse biomedical applications.

Keywords: Biomedical application; drug delivery; imaging; nanoparticles; surface plasmon resonance.

Introduction

The recent progress in utilizing nanoparticles for biomedical purposes stems from advancements in synthesizing and applying engineered nanoparticles. A plethora of polymeric and metallic nanoparticles are extensively explored for potential biomedical applications. Consequently, extensive research focuses on characterizing and modifying their intrinsic properties, such as electronic, optical, physicochemical, and surface plasmon resonance characteristics [1]. These properties undergo changes during the modification of specific nanoparticle attributes, such as size, shape, or aspect ratio. Nanoparticles can be readily synthesized and customized to exhibit novel electronic, optical, magnetic, medical, catalytic, and mechanical properties [2]. This potent customization yields a high surface-to-volume ratio and quantum size effect, dependent on their size, structure, and shape. By incorporating targeted nanoparticles into polymers, innovative materials envisioned as biomedical devices are created. These materials find applications in woven and nonwoven medical materials, polymers, and various other systems [3]. Among the diverse array of engineered nanoparticles, silver nanoparticles stand out with the highest degree of commercialization. A wide range of synthetic methods, including bottom-up and top-down approaches, are

Role of Different Adsorbents in Environmental Remediation

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Abstract

Dissolved impurities pervade all water sources, including groundwater, surface water, and industrial wastewater. In the context of global environmental challenges, such as the greenhouse effect leading to rising temperatures and the consequential melting of glaciers, carbon dioxide emerges as a significant contributor. In fact, carbon dioxide alone accounts for approximately three-fourths of the net greenhouse radiative forcing caused by anthropogenic greenhouse gas emissions. Carbon-based adsorbents have emerged as particularly versatile in capturing carbon dioxide, owing to their exceptional physical and chemical attributes. Addressing these impurities demands diverse treatment methods as water pollution continues to escalate. Among the array of treatment technologies, adsorption stands out for its adaptability and cost-effectiveness. Recent advancements have introduced a new breed of adsorbents with multifunctional capabilities. These innovative materials not only remove pollutants but also exhibit photocatalytic and antibacterial properties, promising enhanced treatment efficacy and potential reductions in wastewater treatment facility footprints. The efficacy of hydrogel adsorbents hinges on the composition and functionalities of the polymer networks within them. Over the past decade, research into hydrogels leveraging these characteristic functionalities has surged. The diverse functionalities offered by polymer networks are pivotal in advancing adsorbents tailored for the removal of various pollutants.

Keywords: Greenhouse gas emissions, adsorbents, pollution.

Introduction

Water, vital to all life on our planet, faces increasing threats due to human neglect and mismanagement of resources, leading to the release of hazardous waste into water bodies [1]. Wastewater, particularly industrial effluents, contains a cocktail of pollutants including organic waste, dyes, and heavy metals, posing significant ecological and health risks to both the environment and humans [2]. The escalating global emission of greenhouse gases, [illegible]

and rising sea levels due to continuous temperature increases [3]. Human activities, particularly the combustion of fossil fuels, agricultural practices, and industrial processes, are primary contributors to CO_2 emissions, exacerbating the problem since the onset of industrialization [4]. The classification of water impurities into suspended and dissolved matters underscores the complexity of pollution. Suspended [illegible]

Green Synthesis of Metal and Metal Oxide Nanoparticles: An Overview of the Fundamentals and Potential Applications

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Abstract

Innovative approaches to today's challenges can be explored in the field of nanotechnology. We can live a more environmentally friendly existence through newly developed technologies, [illegible] products. The fundamental building blocks of nanotechnology are metal and metal oxide nanoparticles, which are the main materials and tools employed in the creation of nanostructured devices. The increased demand for nanomaterials has led to their large-scale synthesis using various toxic solvents or high-energy processes. Nanomaterials can be generated naturally, inadvertently, or through physical or chemical procedures. Still, the need to create metal nanoparticles in a safe, nontoxic, and environmentally acceptable manner has led to an increasing awareness of environmental and safety concerns. The synthesis of nanoparticles using green chemistry is growing in popularity because the resulting particles are nontoxic by nature, no hazardous byproducts are generated. Furthermore, the yield of the synthesis is higher using this route than with other chemical methods. Utilizing biological resources—such as microorganisms, plant components, agricultural wastes, organic matter, gums, etc.—has become a viable alternative in the green production of metal nanoparticles. It's thought to be a more environmentally friendly method than traditional ones. Different spectroscopic techniques, such as a transmission electron microscope, scanning electron microscopy (FTIR), Ultraviolet (UV) visible absorption spectroscopy, and others, can be used to characterize these produced nanoparticles. The green production of metallic nanoparticles and their potential aspects have been covered in this review.

Keywords: Nanotechnology, nanoparticles, green synthesis.

Introduction

Nanotechnology involves crafting and employing materials, gadgets, and systems by manipulating the properties and arrangement of matter at an incredibly minuscule scale, typically ranging from 1 nanometer to 100 nanometers [1]. [illegible] living systems, as we delve deeper into the workings of these naturally occurring nanomachines, we inch closer to the prospect of engineering novel ones with diverse functionalities [2].

Nanotechnology is a dynamic field within science, focused on manipulating matter at [illegible] not only lighter and more durable but also possess superior strength compared to

Environmental Degradation By Anthropogenic Undertakings: A Study From India

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Abstract

Anthropogenic activities are affecting the environmental balance to a great extent after the world has started developing in terms of economy. Urbanization, industrialization and modernization are dominating the courses of these developing areas which require enormous resources that are present in limited quantities in the biosphere. These resources started depleting after a particular duration due to their over exploitation and the human activities resulting in degradation of the ecosystem. Climate change is affecting various natural factors that are evident such as rise in the global annual average temperature, higher temperatures in the North-Indian states and severe heat waves, change in the level of annual average rainfall in the Indian Subcontinent that affects the vegetation of the region, melting of glaciers in the world and around the Himalayan region owing to rise in the sea level across the globe. These changes are affecting biodiversity as it impacts the factors that are essential living conditions such as agriculture, crop production, air quality, availability of potable water, marine life, etc. Detailed discussion of such impacts is done in this article explaining about the reasons for such rapid changes around the globe in general and India in particular.

Keywords: Climate change, anthropogenic activity, urbanization, greenhouse gas.

Introduction

In the recent years the world has done various inventions like Semiconductors and Information Technology (California), Nanotechnology (New York), Digital media (South Korea), Biotechnology (India), Automotive Engineering (Germany) and many others that has changed our lifestyle and made it easier to a great extent. However, these anthropogenic activities have put a pressure on environment and depleting its strength, e.g., ozone depletion, global warming, CO2 enrichment, GHGs, etc. As an outcome, over the coming decades, it is anticipated that natural ecosystems will be less able to provide the essential life-support systems for people [1].

Since the Asia-Pacific region is home to more than 50% of the world's population, actions taken there will certainly have an impact on the entire world [1]. The economy of India has seen a significant growth after the LPG reforms in 1990s and today it is the fastest growing economy in the world. After having huge breakdowns to making the economy stable, it is onerous to focus entirely on the environmental impacts of economy's global openness (industrialisation, urbanisation, exports and imports, etc.). These economic activities are creating worrisome situations for the environment in and around India that are being discussed in this article.

dulteration In Mustard Oil: A Review

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Abstract

Mustard oil is a highly valued edible oil and is a fundamental part of the Indian diet. Rich in monounsaturated and polyunsaturated fats, mustard oil is beneficial for heart health by lowering adverse cholesterol levels. Abundant in omega-3 fatty acids and antioxidants, it possesses anti-inflammatory quality. Celebrated for its delicious taste and wellbeing promoting characteristics, it still a popular choice, despite the wide variety of other edible oils. Edible oils have both nutritional and economic benefits. Owing to its vital role in our routine life and increased demand in both the Domestic and International markets, adulteration of expensive oil with the cheaper oil is a major issue, leading to not just tainted food flavour, but also put consumers' health in danger. Adulteration of mustard oil has repercussions that go beyond individual health problems. Consumer confidence and faith in the market's goods in terms of quality are undermined due to the compromise of the integrity of the food supply chain. Hence, prevention of adulteration and ensuring authenticity is of the utmost importance. Therefore, the purpose of this paper is to investigate the adulteration of mustard oil and its detection using various techniques and methods, including saponification value, peroxide value, and acid value, with the aid of relevant literature. Additionally, it increases customer awareness of the need to guarantee the authenticity and quality of mustard oil.

Keywords: Mustard oil, Adulteration, Health risks, Detection Techniques.

Introduction

Mustard oil, sometimes called sarson or Kachchi Ghani ka Tel, is one of the most popular cooking oils in the Indian subcontinent, which includes India, Bangladesh, and Pakistan.

Mustard oil is obtained by cold-pressing the seeds of mustard plants (Brassica nigra and B. Juncea). Its strong flavour and taste are a result of the high concentrations of alpha-linolenic acid and other phytochemicals, such as allyl isothiocyanates. In addition to its culinary use, mustard oil has traditionally been used for massage and as a home cure. (fig. 1)

Because of its favourable ratio of monounsaturated to polyunsaturated fatty acids and natural antioxidants like tocopherols and phenolic compounds, mustard oil is regarded as a healthy eatable oil from a nutritional perspective [3]. Mustard leaves are rich not only in vitamins, but also in numerous polyphenolics and other structurally diverse phytochemicals with medicinally interesting bio-activities [3]. According to specific research, mustard essential oil has strong antibacterial qualities and may be able to prevent the growth of some dangerous bacterial strains.

Transforming Education For Sustainability With Artificial Intelligence: A Review

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Abstract

The integration of artificial intelligence (AI) into the education sector offers transformative potential for achieving sustainability goals. This paper reviews the current applications of AI in education, its potential to enhance sustainability, and the challenges faced in its implementation. Through a comprehensive analysis, we aim to highlight the pivotal role of AI in fostering a sustainable education system that meets contemporary societal needs.

The integration of artificial intelligence (AI) in sustainable education has become pivotal in addressing the demands of this new industrial era. Through a comprehensive analysis, we aim to highlight the transformative role of AI in fostering a sustainable education system. Sustainable education refers to educational practices that are both environmentally and socially responsible, while also promoting economic growth. In this context, the use of AI in education has the potential to support sustainable education by providing innovative solutions to the challenges faced by traditional educational systems.

Artificial Intelligence (AI) has revolutionized the education sector with its advanced algorithms and big data capabilities. The use of artificial intelligence (AI) in the education industry has been rapidly increasing in recent years. AI is increasingly being applied to sustainable education practices, including personalized learning, reducing teacher workload and improving learning outcomes. The integration of AI in education has opened up new opportunities for sustainable education and development in the industry. Additionally, the paper discusses the potential impact of AI on education sustainability, including improved access to education, enhanced student engagement and motivation and reduced costs.

The study reviews current literature and research on the use of AI in education, highlighting its impact on personalized learning, teacher workload, and learning outcomes. The paper concludes by discussing the challenges and limitations of AI in education and highlighting the need for further research in this area to fully realize the potential of AI in sustainable education.

Keywords: Artificial Intelligence (AI), Sustainable Education, Digital era, Education Transformation

Introduction

In an era marked by rapid technological advancements and environmental challenges, the education sector must evolve to prepare future generations for these complexities. Sustainable education seeks to incorporate principles of sustainability into teaching and learning, promoting long-term ecological, social,

and economic well-being. Artificial intelligence (AI), with its capabilities in data analysis, personalization, and automation, offers significant opportunities to advance sustainable education. It aims to create smart, interconnected systems that optimize processes, improve efficiency, and enable data-driven decision-making.

The education industry is undergoing a significant transformation due to the advancements brought by Industry 4.0, characterized by the integration of technologies such as artificial intelligence (AI), Internet of Things (IoT), and big data analytics. According to the World Economic Forum, Industry 4.0 is expected to generate a potential value of $3.7 trillion in the education sector by 2030 (World Economic Forum, 2018). This transformative wave presents a unique opportunity to leverage AI in education to enhance learning experiences, improve outcomes, and foster sustainability. The rapid advancements have brought about significant transformations across various sectors, and the field of education is no exception. The integration of Artificial Intelligence (AI) in education has opened up new possibilities for enhancing teaching and learning processes, while also promoting sustainability efforts. This review paper aims to provide a comprehensive review of the use of AI in the sustainable education industry. By examining the various applications, benefits, and challenges associated with AI integration, this paper seeks to shed light on the potential for creating a sustainable educational ecosystem through AI-enabled technologies [1,11].

Objectives

The objective of this research paper is to provide a comprehensive review of AI in the sustainable education industry.

- Explore the applications of AI in the education sector and identify their potential for improving teaching and learning processes.
- Examine the benefits and challenges associated with the integration of AI in education.
- Investigate the role of AI in creating a sustainable educational ecosystem.
- Identify strategies for achieving sustainable education.

Methodology

This research paper focuses on analyzing the use of AI in the sustainable education industry. The scope of the study includes the applications of AI in education, the benefits and challenges associated with its implementation, and the potential for creating a sustainable educational ecosystem. The methodology for this research paper involves a systematic review of relevant literature, including scholarly articles, reports, and case studies. Additionally, real world examples of AI applications in the education sector will be examined to provide practical insights into the topic.

Education Transformation

Industry 4.0, also known as the Fourth Industrial Revolution, encompasses the integration of advanced technologies into various sectors, including manufacturing, healthcare, transportation, and education. It is characterized by the convergence of cyber-physical systems, Internet of Things (IoT), cloud computing, and artificial intelligence (AI), among others. Industry 4.0 aims to create smart, interconnected systems that can optimize processes, improve efficiency, and enable data-driven decision-making [2].

Traditional educational models are being disrupted as new technologies reshape the way knowledge is acquired, shared, and applied. It blurs the boundaries between formal and informal learning, making

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समाजशास्त्र में मूल अवधारणाएँ

(Basic Concepts in Sociology)

डॉ. स्वीटी माथुर

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"यह पुस्तक
मैं अपने
परिवार के सदस्यों
को समर्पित करना चाहती हूँ।"

– डॉ. स्वीटी माथुर

पुस्तक के विषय में

प्रस्तुत पुस्तक 'समाजशास्त्र में मूल अवधारणाएँ', राजस्थान विश्वविद्यालय, जयपुर, बी.ए. द्वितीय सेमेस्टर के नवीन पाठ्यक्रमानुसार तैयार की गई है। पुस्तक की प्रत्येक इकाई में पाठ्यक्रमानुसार समस्त पक्षों को पूर्ण एवं सरल भाषा में लिखने का प्रयास किया गया है। प्रस्तुत पुस्तक की विषय सामग्री को तार्किक ढग से प्रस्तुत करते हुए प्रकरण से सम्बन्धित विषयवस्तु आधारित बहुविकल्पीय, लघु उत्तरीय एवं दीर्घ उत्तरीय प्रश्नों को भी सम्मिलित किया गया हैं। प्रस्तुत पुस्तक समाजशास्त्र में प्रयुक्त जटिल शब्दावली के लिए अंग्रेजी के शब्दों का भी प्रयोग किया गया है। इस पुस्तक में नवीन एवं प्रमाणिक सामग्री प्रस्तुत की गई है जो विद्यार्थियों के लिए बोधगम्य एवं रुचिकर है। हम आशा करते हैं कि विद्यार्थी इससे निश्चित रूप से लाभान्वित होंगे।

लेखक परिचय

डॉ. रवीटी माथुर वर्तमान में **कनोड़िया पी.जी. महिला महाविद्यालय जयपुर** में **सहायक आचार्य** के पद पर कार्यरत है। आपने **एम.ए., नेट, एम.फिल., पी–एच.डी.** की शैक्षणिक योग्यता प्राप्त की है। आप को शिक्षा के क्षेत्र में **18 वर्षों** का अनुभव प्राप्त है। इसके अतिरिक्त आपके अनेक आर्टिकल, पेपर व पुस्तक भी प्रकाशित हो चुकी है।

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RECENT ADVANCES IN GREEN TECHNOLOGY AND SUSTAINABLE DEVELOPMENT

for the chapter entitled

Study on Conductometric Titrations

Authored by

Tejaswini Singh & Dr. Nidhi Gupta

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7

Study on Conductometric Titrations

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Dr. Nidhi Gupta**

Introduction

A technique where in the conductometer, which measures the changes in conductance of the solution created by the ions in the solution, is used to determine the moment at which the reaction is finished. The basis of a conductometer's operation is Ohm's law. To determine an acid's strength, we place the acid in a beaker and submerge the conductometer's electrode into the solution. This gauges the acid's conductivity. Now that we are titrating this acid solution against a known-molarity base, the conductance begins to decrease. This results from the acid's H+ ions binding to the base's OH- until a minimum conductance is obtained. As we proceed, the conductance begins to rise once more. This is now due to the free ions of Base present in solution. The employment of an ionic exchange resin as an electrolyte for a space application by General Electric in 1959 brought polymer electrolyte membrane fuel cells to the attention of the general public [1]. A year later, the same company created the idea for a new electrolyzer that employed a solid polymer electrolyte rather than a liquid alkaline electrolyte in an effort to overcome the drawbacks of alkaline water electrolyzers [2]. The point at which this transition occurs is called Equivalence point. At Equivalence point we measure the volume of base used to neutralize the acid ions completely in the solution. Putting these values in formula we can get the strength of acid.

In order to reduce the influence of errors in the conductometric titration to a minimum, the angle between the two branches of the titration curve should be as small as possible. If the angle is very obtuse, a small error in the conductance data can cause a large deviation. The following approximate rules will be found useful.

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- The outcome will be more accurate the smaller the conductivity of the ion that replaces the reactive ion. Titrating a silver salt with lithium chloride is therefore preferred over HCl. Since acetates have low conductivity, cations should typically be titrated with lithium salts and anions with acetates.
- The angle of the titration curve is more acute the larger the conductivity of the anion of the reagent that reacts with the cation to be tested, or vice versa. Since the conductivity increases steadily from the beginning, titrating a mildly ionized salt does not yield satisfactory results. Hence, the salt present in the cell should be virtually completely dissociated; for a similar reason; the added reagent should also be as strong electrolyte.
- Non-linear titration curves occur when the volume of the solution increases continuously during a titration, unless the conductance is adjusted for this impact. V is the initial volume of solution, and V′ is the total volume of the reagent supplied. The measured conductance can be corrected by multiplying it by either total volume (V+V′) or by the factor (V+ V′)/V. The correction relies on the assumption that the conductivity is a linear function of dilution, which is only roughly right.
- The reagent for the conductometric titration is typically several times (at least 10–20 times) more concentrated than the solution being titrated in order to minimize V. The volumetric measurement can then be performed using a micro burette.

Fuel cells with proton exchange membranes have grown in significance for uses requiring short response times to load variations and quick startup [3]. The essential part of those kinds of devices are proton exchange membranes, and their specifications must include low electronic conductivity, high proton conductivity, good chemical and thermal stability, low permeability to fuel and contaminants, low electro-osmotic drag coefficient, good mechanical qualities, and low cost [4].

Conductometric Titrations

If there is a discernible difference in conductance between the reagent of the reaction product and the original solution, the conductance method can be utilized to monitor the titration's progress. The equivalency point can be found with relative values alone; therefore knowledge of the cell constants is not required. An ion's conductance is proportionate to its concentration (at constant temperature), but due to the dilution effect of adding water at the same time as the reagent, a given solution's conductance will typically not change linearly with the addition of reagent. Deviations from linearity can also result from the partially soluble product of a precipitated product or from the hydrolysis of reactants or products. It is simple to estimate the titration curve's shape. The concentration of each ion at any point in the titration is calculated by the usual methods based on stoichometry, equilibria, and dilution.

An analytical method known as conductometric titration uses the concept of mobility difference, whereby ions with mobility are substituted for ions with a different mobility. When compared to acid-base or potentiometric titrations, this method has advantages when it comes to studying specific systems. These systems are those that produce hydrolysis products at the same spot or products with a significant degree of solubility. Aside from that, the conductometric titration remains accurate in both concentrated and relatively diluted solutions. This method can be used to investigate both colored and colorless liquids. Since they have no effect on the system being studied (the reaction), the measurement electrodes are the only component that is not a part of the solution [5].

Principle

The foundation of the conductometric titration concept is the observation that, as one ion is substituted for another throughout the titration process; the ionic conductivities of the two ions are inevitably different, causing the conductivity of the solution to fluctuate during the titration process. By graphing the change in conductance as a function of the volume of titrant added, the equivalency point can be found visually. The following are the main ideas:

- The ability to conduct Adjust: -The capacity of a solution to convey an electric current is known as conductivity. Conductivity changes as a result of the reaction between the titrant and analyte in a conductometric titration.
- Endpoint Detection: - The analyte and titrant reaction having reached its conclusion is the titration's endpoint. Conductivity has changed significantly at this time.
- Formation of Ionic Species: - The presence of ions largely affects a solution's conductivity. The titration process modifies the conductivity of the solution by causing ions to form or be consumed as a result of the chemical reaction.
- Titration Curve: - A titration curve is created by graphing the conductivity against the volume of titrant applied. The exact volume of titrant required for full reaction is indicated by the curve's inflection point, which matches the equivalency point.
- Sensitivity and Selectivity: - Conductometric titrations are sensitive to a wide range of reactions involving ions. The method is selective in detecting specific ions based on their conductivity changes.
- Titration Types: -Conductometric titrations can be applied to various types of reactions, including acid-base, precipitation, and complexation reactions. The choice of titration depends onthe nature of the chemical reaction being studied.

Overall, the principle of conductometric titrations relies on monitoring changes in electrical conductivity to determine the endpoint of a titration accurately, providing a valuable tool for quantitative analysis in diverse fields of chemistry.

On the other hand, the indicator may cause contamination or interact with the system during the acid-base titration. Because of the potential impact of indicators' broad pH range on the determination error value, using them comes with additional drawbacks [6]. The system under study does not contain high quantities of unusual electrolytes, which could interfere with the reaction and significantly lower the precision of the results [7].

This is the drawback that the conductometric titration brings. Because it took longer to reach system equilibrium at lower concentrations, it was necessary to employ that concentration or higher. The duration of a full titration experiment was set at 36 hours [8].

The key components that determine the conductivity of the solution.

- **Ion Size**

The size of the ions is inversely correlated with the conductivity of the solution. Because the ions' mobility will decrease as their size increases, the conductivity of the solution will decrease if the ions' size increases.

- **Temperature**

The mobility of the ions in the solution will increase as the temperature rises. Thus, the conductivity of a solution is directly influenced by temperature. For example, conductivity will rise with temperature and vice versa.

- **Reactant Concentration**

The analyte and titrant concentrations have a direct impact on how much the conductivity changes. Higher concentrations often lead to more pronounced conductivity changes, improving the precision of the titration.

- **Nature of the Reaction**

The conductometric titration curve's form and the ease of endpoint detection are influenced by the type of chemical reaction (acid-base, redox, complexation, or precipitation) that takes place during the titration.

- **Electrolyte Strength**

The strength of the electrolytes created during the titration affects the conductivity of the solution. Conductivity is more influenced by strong electrolytes than by weak electrolytes.

- **Electrode Characteristics**

The sensitivity and accuracy of conductometric titrations might be impacted by the kind and state of the electrodes used in the measurement. It's crucial to maintain and calibrate electrodes properly.

- **Quantitative Analysis:** Accurately determining the concentration of analytes in a sample is made possible by the suitability of conductometric titrations for quantitative analysis.
- **Basic apparatus:** Conductometric titrations use very simple apparatus, which makes the technique useful for both normal laboratory work and teaching.
- **Non-Destructive:** Conductometric titrations are frequently non- destructive, enabling the recovery of the sample under analysis following the completion of the titration.
- **Adaptability to Non-Aqueous Systems:** Conductometric titrations can be extended to organic reactions and materials with low water solubility by adapting them for non-aqueous solvents.
- **Cost-Effective:** Compared to certain other titration techniques, conductometric titrations are more affordable due to the ease of use of the apparatus and the absence of the requirement for external indicators.[9]
- **Educational Value:** Conductometric titrations are useful in classrooms because they give students practical experience with titration methods and analytical chemistry concepts.
- **Possibility of Automation:** Technological developments have made it possible to automate conductometric titrations, increasing accuracy and lowering the possibility of human error.

For a variety of applications, conductometric titration is a preferred method in many analytical laboratories due to itssensitivity, adaptability, and ease of use.

Conclusion

To sum up, conductometric titrations are an extremely useful and adaptable analytical method with a wide range of applications in various areas of chemistry. Numerous benefits flow from the method's emphasis on measuring changes in electrical conductivity during chemical reactions, including high sensitivity, adaptability to different types of titrations, and the ability to observe changes in real time. Conductometric titrations are still essential for research, environmental monitoring, and quality control in the food and pharmaceutical industries, even as technology develops. The method's versatility in handling aqueous and non-aqueous systems, together with its capacity to offer non-destructive analysis, further augments its usefulness in tackling intricate analytical problems. Fundamentally, conductometric titrations continue to be an essential component of analytical chemists' arsenal because they provide a strong and user-friendly way to comprehend and measure chemical reactions with wide-ranging ramifications for both scientific study and industrial applications.

- **Purity of Reagents and Solvents**

Base conductivity can be impacted by impurities that bring extra ions into reagents or solvents. Accurate findings depend on highpurity chemicals.

- **Titration Pace**

The form of the titration curve and the sharpness of the endpoint can be affected by the pace at which titrant is introduced. Although it could increase accuracy, slow adding may cause unintended consequences.

- **Effects of the Solvent**

The solution's conductivity may be impacted by the solvent selected. Although aqueous solutions are usually used for conductometric titrations, non-aqueous solvents can also be used with some adjustments.

- **Titration Conditions**

A number of factors, including pH and ionic strength, can influence how ions behave in solution, which in turn can affect conductivity and the titration curve.

- **Instrument Calibration**

Accurate and dependable findings depend on the conductometric titration apparatus, comprising electrodes and measuring instruments, being properly calibrated.

- **Sample Contamination**

External contamination has the potential to add extra ions to the sample, which could alter the baseline conductivity and cause titration errors.

Advantages

- **High Sensitivity:** Conductometric titrations have a high degree of sensitivity, making it possible to identify even minute changes in conductivity. For an accurate determination of the endpoint, this sensitivity is essential.
- **Wide Applicability:** This technique is flexible enough to be used in many different areas of chemistry and can be applied to a range of titrations, such as acid-base, redox, complexometric, and precipitation processes.
- **Real-Time Monitoring:** The titration process can be observed in real-time using conductometric titrations. Rapid changes in conductivity make it possible to identify the endpoint right away.
- **No External Indicators Required:** Conductometric titrations frequently don't call for external indicators, in contrast to certain
- **Other titration techniques.** An inherent indicator is provided by the abrupt drop in conductivity at the equivalency point.

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RECENT ADVANCES IN GREEN TECHNOLOGY AND SUSTAINABLE DEVELOPMENT

for the chapter entitled

Different Method to Measure Solid Waste and Factors affecting their Generation Rate: A Review

Authored by

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RECENT ADVANCES IN GREEN TECHNOLOGY AND SUSTAINABLE DEVELOPMENT

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CONTENTS

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Different Method to Measure Solid Waste and Factors affecting their Generation Rate: A Review

Prerana Gaur*
Dr. Nidhi Gupta**

Introduction

There is a rising demand for goods as a result of the population's rapid growth. Production, consumption, and rejection from a variety of industries, including commercial, industrial, institutional, and agricultural, thereby rise as well. Solid waste is the term used to describe this huge amount of rubbish generated and rejected.

A significant amount of this solid waste is non-biodegradable, necessitating recycling because it depletes natural resources and jeopardizes effective and sustainable development. Solid waste management is a step in the recycling process that includes managing waste generation, storage, collection, transportation, and appropriate disposal. The solid waste measuring approaches covered in this review paper include the weight-based method, the volume-based method, composition analysis, sampling strategies, trash creation rates, and technological tools.[1]

Weight based Method

A weight-based approach to measuring solid waste entails separating the debris by hand and determining its quantity and composition. An overview of a common strategy is provided below:

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- **Sampling Waste:** Random Sampling: Choose representative samples from various points in the waste generation area. Sampling that is stratified: Sort garbage into groups (called strata) according to attributes such as origin or kind. To achieve a thorough analysis, sample each stratum.
- Waste was manually sampled and categorized, with recyclables, organics, and non- recyclables being separated out. Automated Sorting: Classify garbage according to predetermined criteria by using automated sorting technology, such as sensors and conveyor belt.[2]
- **Weighing:** Measure the weight distribution of recyclables, organics, and non-recyclables by weighing each group independently. Total garbage: To determine the overall amount of garbage generated, weigh each sample of rubbish.
- **Composition Analysis:** Visual Inspection: Use visual analysis to determine common components and objects in the waste's composition.[3] Laboratory Analysis: To ascertain the percentage composition of various materials (such as plastics, paper, and glass), do a thorough laboratory analysis on representative samples.
- **Extending Data:** The process of scaling involves estimating the overall waste produced for an area or population by extrapolating the results from the waste sample. Statistical Techniques: To account for variability and offer confidence intervals for the estimates, use statistical techniques.
- **Consistent Monitoring:** Periodic Surveys: Measure trash periodically to record seasonal variations and shifts in waste composition over time. Continuous Monitoring: To track trash creation trends in real-time, if at all practicable, implement continuous monitoring systems.
- **Integration of Data:** GIS Mapping: For geographical analysis and planning, combine waste data with Geographic Information System (GIS) mapping. Database Management: Keep an extensive database up to date for effective record-keeping and future use.

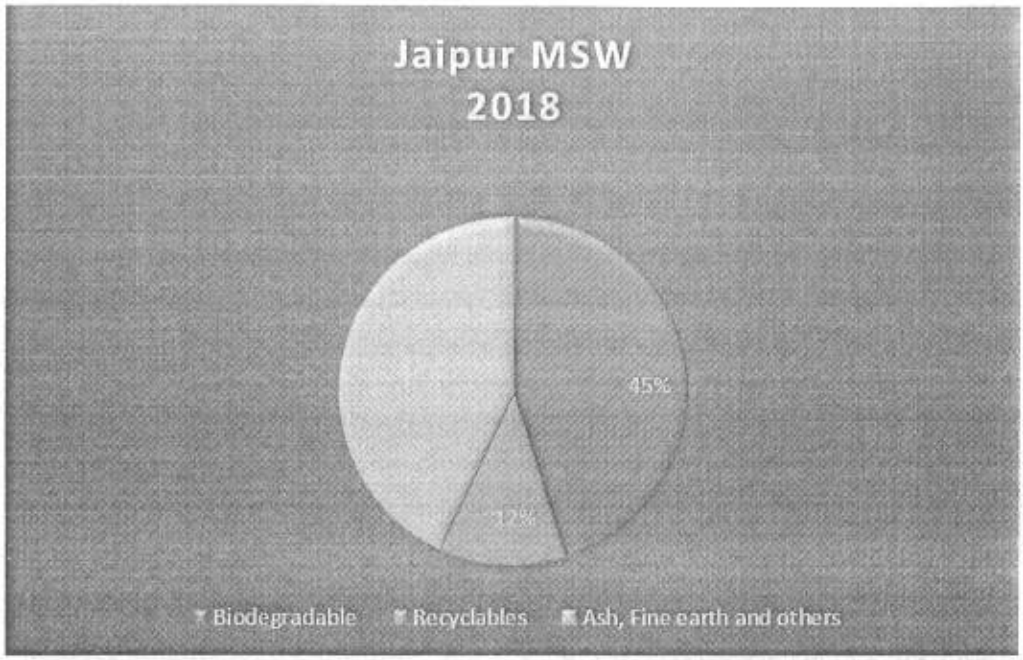
Volume based Method

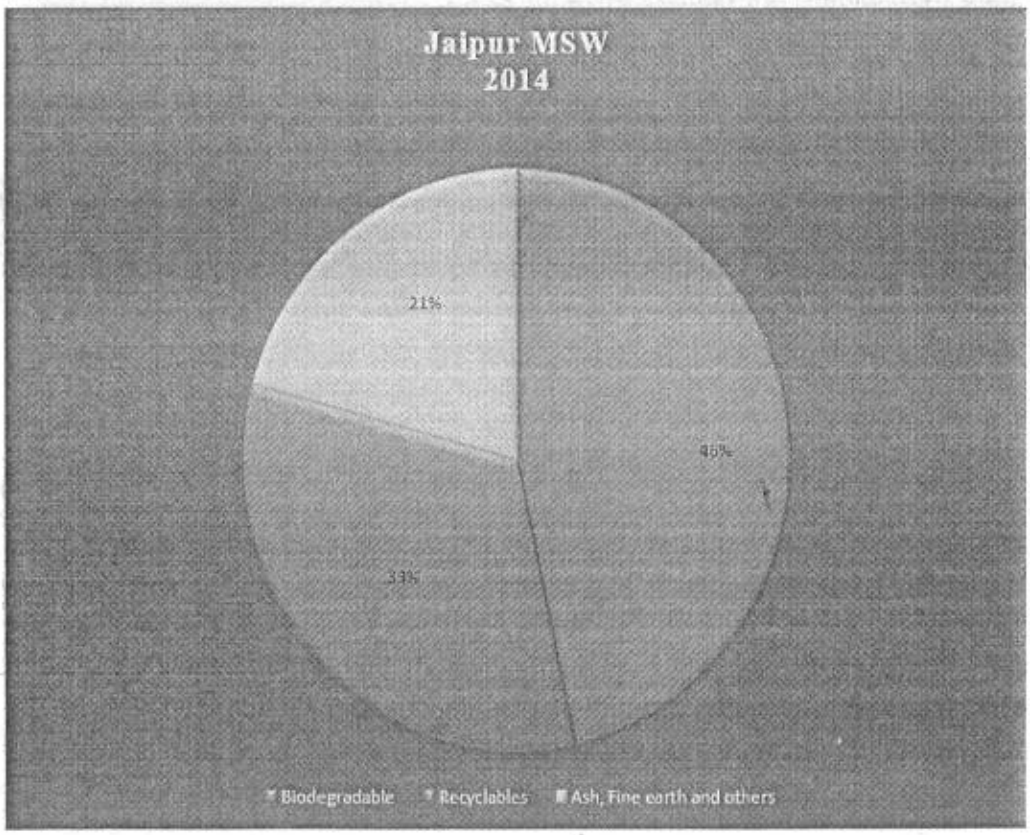
Solid waste can be measured using a volume-based approach, which measures the garbage's actual volume as opposed to its weight. Below is a summary of the steps in this approach:

- **Measurement of Container Volume:** Container Types: Determine and quantify the quantities of different types of garbage containers that are collected, such as bags, dumpsters, and bins. Standardization: To maintain consistency, make sure measurements are standardized.[4]

- **Evaluation of Container Fill Level:** Visual Inspection: To determine the amount of waste produced, visually evaluate the fill levels of waste containers on a regular basis. Sensor Technology: Use sensor technologies to automatically measure fill levels, such as ultrasonic sensors.
- **Compressive Strength of Waste:** Compaction Ratio: If garbage is compacted prior to disposal, take this into account. This ratio aids in calculating the volume that existed prior to compaction. Monitoring the Compactor: In order to ensure precise volume estimates, keep an eye on the compaction cycles and ratios while using waste compactors.
- **Spatial analysis and GIS mapping:** Mapping Container Locations: To map the locations and capacities of garbage containers, use Geographic Information System (GIS) mapping. Spatial Analysis: Use spatial patterns analysis to find areas with different rates of garbage generation and to optimize waste collection routes.
- **Engagement with the Community:** Public Reporting: To offer information on garbage volume, encourage locals or companies to record container fill levels or take part in citizen science projects. Smart Bins: Use sensors to communicate fill level data for real- time monitoring by implementing smart bins.
- **Consistent Reporting and Monitoring:** Scheduled Inspections: Measure and check frequently to monitor variations in waste volume over time. Data Reporting: To record volume measurements and trends, keep an organized reporting system.
- **Integration and Analysis of Data:** Data Compilation: Combine a large amount of data with historical records to create a thorough database. Analytical Tools: Make use of analytical tools to spot trends, connections, and possible waste reduction opportunities.
- **Education and Public Awareness:** Feedback Loop: Create a feedback loop by supporting waste reduction activities, raising awareness, and providing the community with volume statistics. Educational Campaigns: Run educational initiatives to encourage ethical trash disposal methods. Volume-based approaches provide useful information on the patterns in waste generation, especially in places where weight-based measures could be difficult. Planning infrastructure, involving the community in sustainable waste management practices, and streamlining waste collection routes are all made possible with this strategy.

Factors Affecting SWM System





- **Production Procedures:** Efficiency and Waste Minimization: As manufacturing processes become more technologically advanced, production can become more efficient and waste produced during manufacturing can be minimized. Green and lean manufacturing techniques seek to reduce waste production.
- **Generation of E-Waste:** Obsolescence and Upgrades: As electronics technology develops quickly, products become outdated and require frequent upgrades. This leads to the disposal of outmoded gadgets, which creates a significant amount of electronic garbage, or e-waste
- **Technologies for Waste Treatment:** Waste-to-Energy: The quantity of waste dumped in landfills may decrease as a result of improvements in waste treatment technology like waste-to-energy conversion. Resources are recovered and energy is produced with the help of efficient waste conversion technology.5. Electronic commerce and digitization: Packaging and Delivery: The growth of digital services and e-commerce may have an impact on the production of solid waste by requiring more packing materials and effective delivery logistics.
- **Consumer Adoption of Technology and Behaviour:** Disposable Culture: The widespread use of technology might encourage a disposable culture in which things are thrown away with ease, which has an effect on the production of solid waste. This also applies to throwaway devices and electronics.
- **Technologies for Waste Management:** Sorting and Recycling: More efficient resource recovery is achieved through technological advancements in garbage sorting and recycling procedures. Recycling capabilities are improved by automation and intelligent technologies.
- **Astute Packaging:** RFID and Smart Labels: While smart packaging technologies like RFID and smart labels can increase the effectiveness of the supply chain, they also have the potential to introduce new elements that alter the composition of waste. It is vital to comprehend the intricate correlation between the development of technology and the production of solid waste in order to execute sustainable waste management strategies. In order to reconcile innovation with environmental responsibility, waste reduction methods must be adopted in tandem with the issues raised by new materials and consumption trends.

Conclusion

In conclusion, solid waste management done right is essential to the sustainability of the environment. We can lessen the effect that garbage has on our

- **Population:** Growth in Population: The increased consumption of goods and services that comes with a growing population frequently results in increasing waste generation. Urban Migration: Dense populations growing quickly in cities can result in concentrated trash production, posing a challenge to the infrastructure supporting garbage management.
- **Urbanization:** Consumption Patterns: Consumption patterns in urban areas are altered, with a preference for packaged and convenience goods, which leads to an increase in non- biodegradable trash. Demands on Infrastructure: To handle the increased concentration of waste generators, urbanization necessitates a strong infrastructure for waste management.[5]
- **Economic Factors:** Consumption and Affluence: Higher consumption and affluence can result in more trash being produced, especially in the form of packaging and electronic waste. Industrialization: When economies grow, industries tend to expand as well, bringing with them industrial waste that needs to be managed by specialists.
- **Cultural and Social Factors:** Lifestyle Changes: Changing social norms and cultural shifts have an impact on lifestyle decisions, which in turn has an impact on trash generation. For example, a culture that is more disposable is producing more solid trash. Attitudes Toward Recycling: The success of waste management programs is influenced by cultural attitudes on recycling and trash disposal methods. These elements frequently interact, each having a distinct effect on waste formation. For instance, higher levels of economic status and dense population in metropolitan areas may result in increasing production of electronic trash from increased technology use.[6] Similarly, a rise in non-biodegradable garbage can be caused by cultural norms that value convenience and single-use goods. It is essential to comprehend these interactions in order to create waste management plans that work. It entails taking into account the waste stream's characteristics and content in addition to its volume. In order to reduce the environmental impact of solid waste generation, sustainable solutions necessitate a comprehensive approach that incorporates social, cultural, economic, and urban planning factors.
- **Technological Variables:** Solid waste generation patterns are significantly shaped by technological elements. The following are some significant ways that technology affects this aspect:
  - **Product Design and Innovation:** Packaging Materials: New materials may be developed as a result of advancements in packaging technology, which may have an impact on the makeup of solid waste. For example, longer-lasting garbage is a result of packaging using more non-biodegradable plastics.

ecosystems by reducing, reusing, and recycling. Furthermore, appropriate disposal techniques—such as waste-to-energy technology and sanitary landfills—are essential for reducing pollution and fostering a healthier, cleaner environment. Adopting innovative solutions and sustainable techniques for solid waste management is our joint responsibility.

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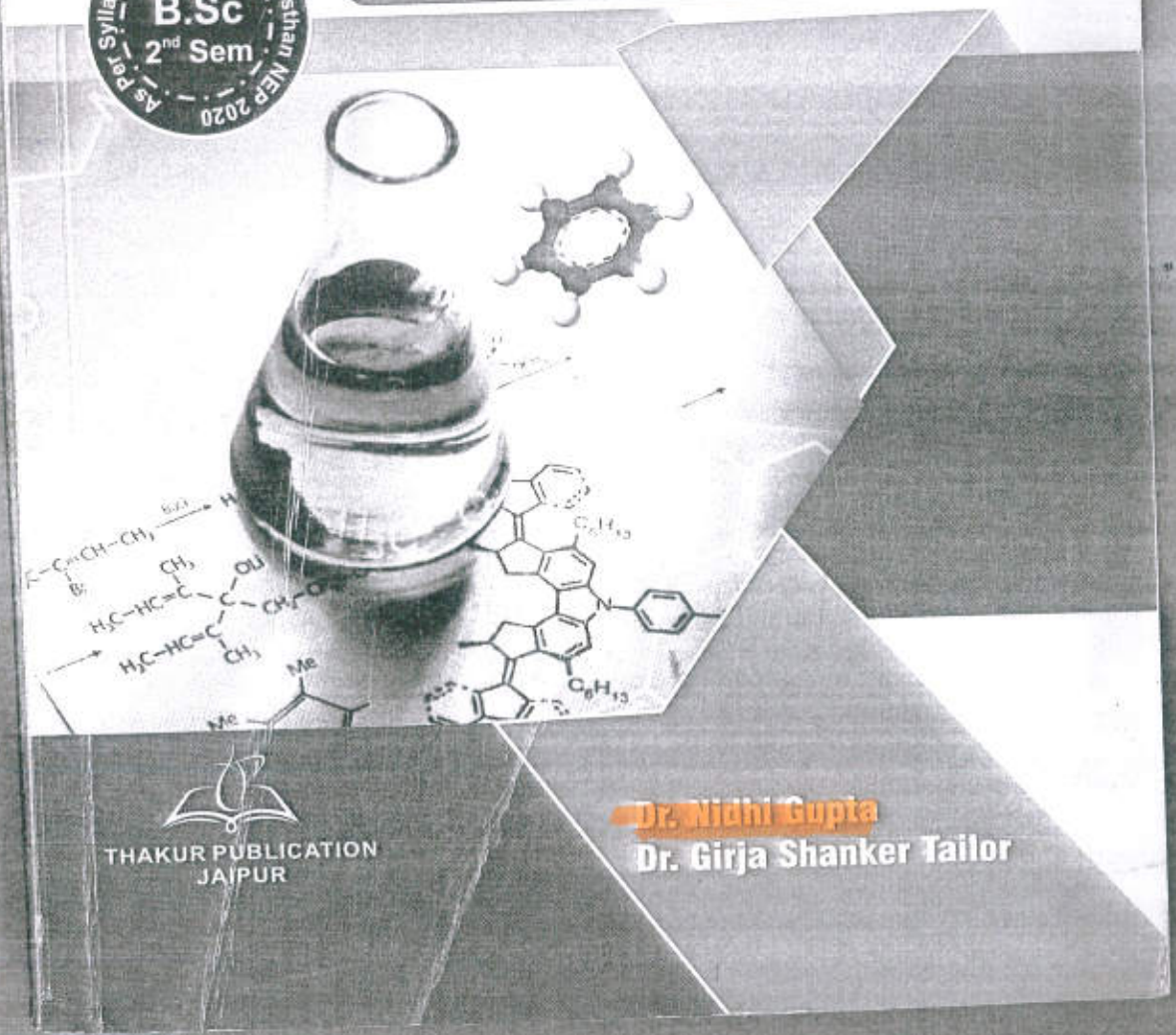

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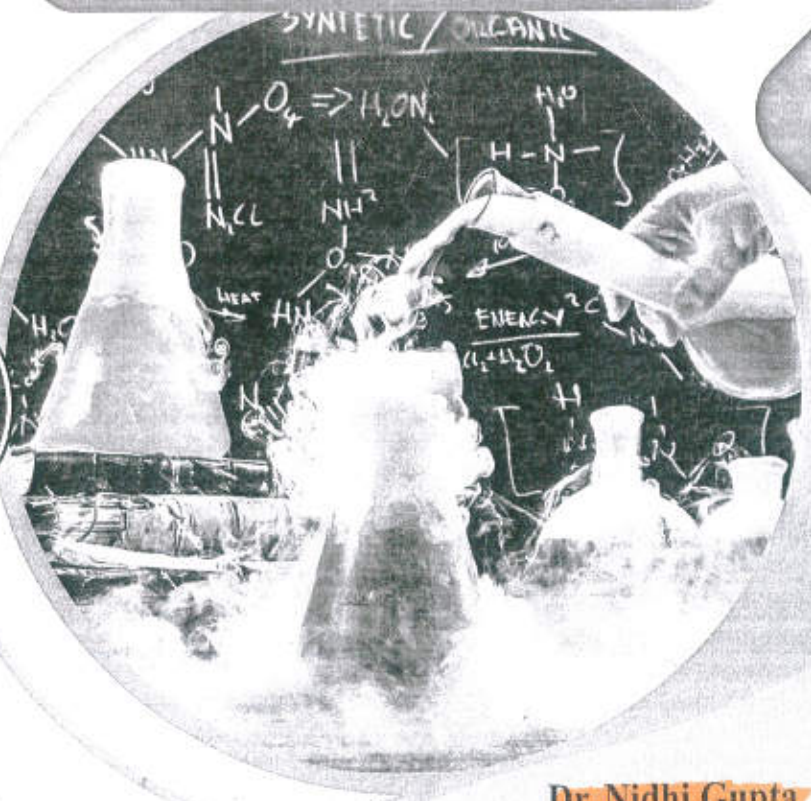

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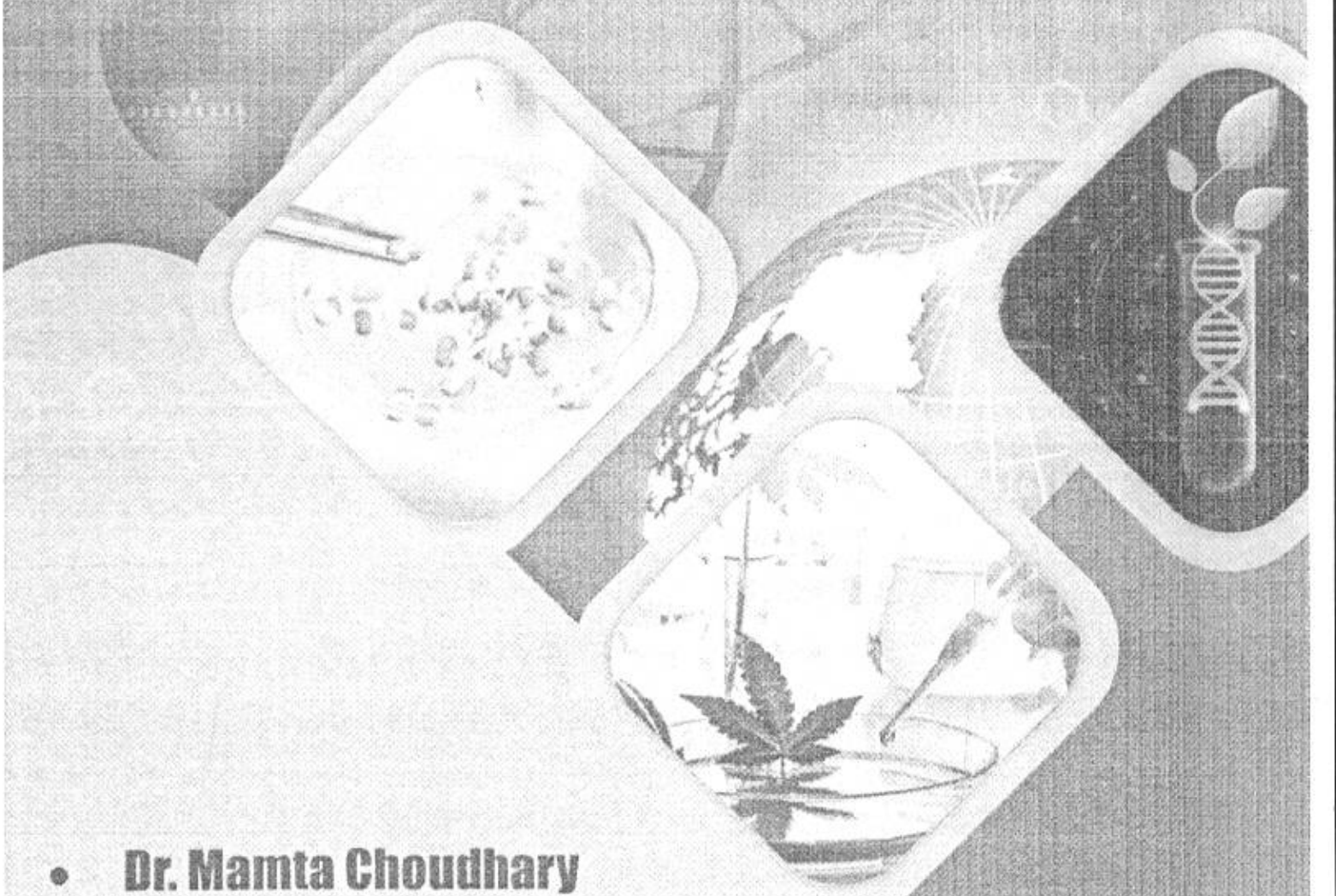
INNOVATIONS IN BIOSCIENCE



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CONTENTS

Chapter 10

Intellectual Property Rights- A Right to Inventor

Ritu Gupta[1*], Kamakshi Tomar[2] and Yogita Solanki[3]
[1]Associate Professor, [2,3]Assistant Professor,
Department of Botany, Kanoria PG Mahila Mahavidyalaya, Jaipur

Patenting or Intellectual property rights (IPRs) have been created to protect the right of inventors to enjoy their creations and discoveries. There is increasing trend of patenting plants and plant products over the last few decades. The chapter deals with Major World Organizations dealing with IPR, types of IPR, legal provisions, patentability guidelines, and a sample of patents granted. India has currently adopted the sui generis system of intellectual property rights (IPR) protection to plant varieties under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO). The private sector can be indulged in varietal development research through IPR. In the recent past, six big companies viz. Monsanto, Syngenta, DuPont, BASF, Bayer, and Dow collectively controlled more than 75% of the agrochemical market worldwide and 63% of the commercial seed market and they were known as the 'Big Six' which were later referred as the 'Mighty Four'.

***Keywords** : WTO, TRIPS, IPR, Patent, Big Six*

INTRODUCTION

The legal characterization of new inventions is one of the biggest challenges for scientists. Hence, patenting or Intellectual property rights (IPRs) have been created to protect the right of inventors to enjoy their creations and discoveries. Intellectual property is divided into two categories: Industrial property, which includes inventions (patents), trademarks, industrial designs, and geographic indications of source; and Copyright, which includes literary

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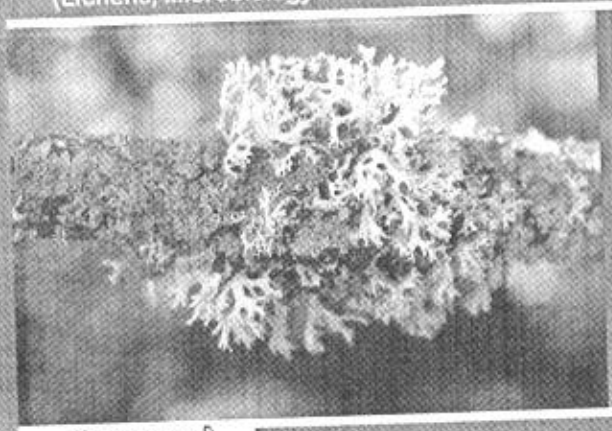

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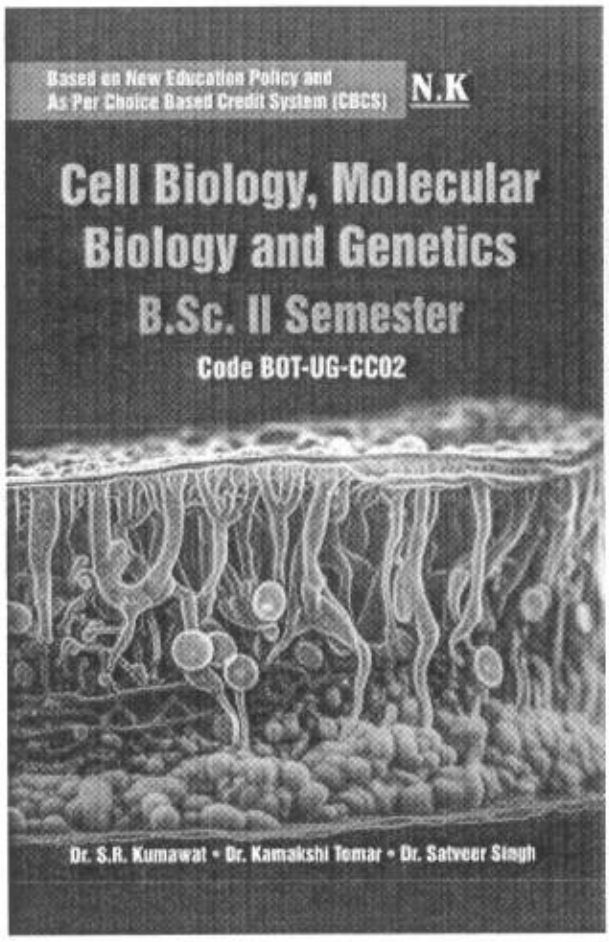
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CONTENTS

53

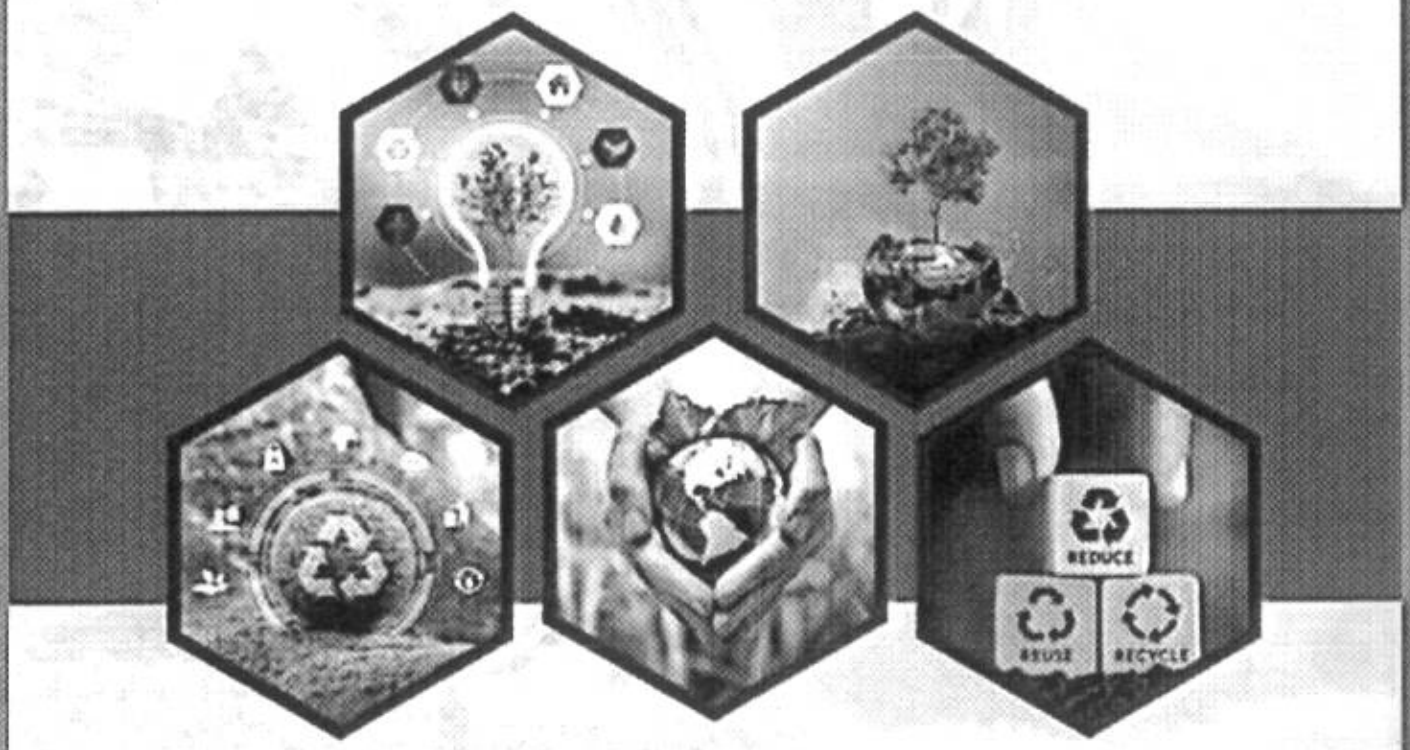
AANANDA: THE INDIAN PATH TO HAPPINESS AND WELL-BEING

— Aayushi Soral & Harshita Maheshwari

Abstract :

This chapter examines Ananda, the Indian concept of pleasure and well-being, and compares it with conceptions from Western positive psychology. Ananda, which has its roots in Indian intellectual traditions and writings such as the Vedas and Upanishads, is more than just pleasure or momentary satisfaction; it represents a profound, permanent feeling of contentment and inner calm. The chapter opens by delving into the substance of Ananda in the Indian context, emphasizing its central role in the search for Moksha (liberation) and its inherent relationship to the self (Atman) and universal awareness (Brahman). The chapter then moves on to a comparative examination of Western positive psychology, which focuses on hedonic and eudaimonic well-being. Hedonic well-being prioritizes pleasure over suffering, whereas eudaimonic well-being prioritizes self-actualization, purpose, and personal progress. The combination of these Western ideas with Ananda uncovers fascinating similarities and differences. For example, while both traditions emphasize the need for self-awareness and mindfulness, their ultimate aims differ: Western frameworks frequently strive for a

"REDUCE, REUSE, RECYCLE: TRANSFORMING PERSPECTIVES ON WASTE MANAGEMENT"



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INDEX

TEMPLE WASTE MANAGEMENT IN INDIA: EXPLORING SUSTAINABLE PRACTICES AND CULTURAL PRESERVATION

Dr. Vishnu Priya Temani
Assistant Professor, Department of Accountancy and Business Statistics

ABSTRACT

This research delves into the critical realm of waste management within temples across India, highlighting the significance of sustainable practices in preserving cultural heritage and environmental integrity. Temples, serving as focal points of religious and social activities, generate a diverse range of waste materials, including organic offerings, floral decorations, packaging materials, and ritual items.

The study begins by elucidating the unique challenges posed by temple waste, including cultural sensitivities, seasonal variations, and limited resources. It examines existing waste management practices in temples, ranging from traditional methods to modern innovations, and evaluates their effectiveness in addressing waste generation, segregation, collection, and disposal.

Furthermore, the research investigates the environmental impact of temple waste, considering factors such as pollution, resource depletion, and ecosystem degradation. It emphasizes the importance of integrating sustainable waste management strategies, such as waste reduction, recycling, composting, and awareness campaigns, to minimize the environmental footprint of temple activities.

Cultural preservation is a central theme throughout the study, recognizing the intrinsic connection between waste management practices and the preservation of religious traditions, beliefs, and values. The paper explores ways to harmonize modern waste management techniques with cultural norms and rituals, fostering a holistic approach to sustainability in temple management.

In conclusion, this research advocates for the adoption of comprehensive waste management plans tailored to the unique needs of temples, encompassing environmental stewardship, cultural preservation, and community engagement. It offers insights and recommendations for temple authorities, policymakers, and stakeholders to promote responsible waste practices and uphold the spiritual and ecological legacy of India's temples.

Key Words: Waste Management, Cultural Preserves, Environmental Impact, Ecosystem

Introduction

India, a land with a rich and diverse history, has the epitome of prosperity, both spiritually and materially. In this manuscript, we delve into the multifaceted role of temple waste management in India, and exploring their significance beyond being mere religious institutions. Temples are not only centers of worship but also crucial components that shaped the socio-economic-political landscape of the nation.

Religious Importance of Indian Temples:

1. **Worship and Rituals**: Temples are centers of worship where people may develop spiritually and establish a connection with the divine. There are elaborate rites and rituals performed
2. **Spiritual Education**: Temples serve as centers of learning where both scholars and seekers may receive spiritual instruction.
3. **Bhajans and Kirtans**: The precincts of temples resonate with devotional music in the form of bhajans and kirtans. These cultural manifestations promote community cohesion in addition to deepening the spiritual experience.

Social and Economic Importance of Indian Temples:

1. **Community Gathering**: By organizing events, temples help communities come together and develop a sense of common identity. Events and festivals drew people together across social divides.
2. **Cultural Preservation:** Temples, with their wealth of art and architecture, formed strongholds for the preservation of culture. Within their walls blossomed literature, art, and sculpture.
3. **Welfare and Education**: A large number of temples operate hospitals and educational facilities, promoting societal welfare. Education covered a wide range of subjects in addition to spirituality.
4. **Economic Hubs**: Drawing pilgrims and traders, temples serve as economic centers. Local markets expanded along with the surrounding regions as a result of the migration.
5. **Patronage of the Arts:** Craftspeople and artisans are able to create beautiful handicrafts, paintings, and sculptures thanks to the patronage of temples. It play a vital role in economy as this promoted and encourage the economic growth in addition to preserving traditional arts.
6. **Trade and Commerce**: Temples become hubs for trade and commerce because of their strategic locations. They made business transactions easier, which boosted the local economies.
7. **Agricultural Prosperity**: A lot of temples has large agricultural lands. The money raised financed both the operations of the temple and the general prosperity of the local economy.
8. **Job Creation**: Temple building and upkeep resulted in the creation of jobs.

Ram Mandir Pran Prathishtha Movement: From Ethnic Center to Economic Epicenter Following a protracted wait, Lord Ram was dedicated at the recently built temple in Ayodhya, the city of his birth. Ayodhya's economy, which was formerly renowned for its coaching centers, has completely changed as a result of the construction of the Ram temple. Within a year, tourism went from 2.25 lakh to 2.25 crore, and land prices have increased tenfold. Joy is felt in the city and throughout

India as a result of Ayodhya's expansion during the Ram Mandir Construction phase and its bright future, with more job possibilities anticipated in the construction, hospitality, and other industries

The temples of India are vibrant hubs that has an impact on all facets of life, not solitary places of religious devotion. Their influence, has shaped the nation's social, political, and economic fabric in addition to spiritual spheres. Gaining insight into this comprehensive role enables one to appreciate the historical depth and intricacy of India's cultural fabric.

Significance of the Study

Our temple offerings demonstrate our abundance in giving to our gods. An estimated 800 million tonnes of flowers, including yellow marigolds and roses, are presented in the nation's gurudwaras, mosques, and temples. Flowers are accompanied by packages of vermilion, packs of fake incense, and synthetic bangles. Devotees add many thins with their prasadam, But when these kind donations become enormous garbage, it poses a difficult issue that harms the ecosystem.

Temple sacrifices are not supposed to be disposed of in landfills since they are seen as scary. The majority of temples dispose of their waste in nearby lakes, ponds, and rivers. Numerous temples across the nation, particularly those situated in the Ganges basin, directly dispose of their daily garbage. Most religious places do not have appropriate disposal methods for the majority of flowers, plant leaves, coconut shells, milk, and curd, thus these materials are disposed of at random in a number of public locations. The World Health Organization determined in 2005 that 36 percent of the pesticides used in flower plantations were extremely toxic and might negatively impact health by causing skin rashes, eye issues, Infection diseases, communal problem and respiratory issues.

It takes a lot for someone to stop for even a few moment to consider what happens to this problem. Rather of being indifferent to the harm done to the environment, a solution that works for all of India's religious institutions must be created.

Objective of the Study

In this research we can contribute valuable insights into enhancing waste management practices in temples while preserving their cultural significance and promoting environmental sustainability. The Objectives of the manuscript are:

1 To identify the challenges and obstacles faced in managing temple waste effectively in India.

2 To explore and analyze sustainable waste management solutions suitable for temples.

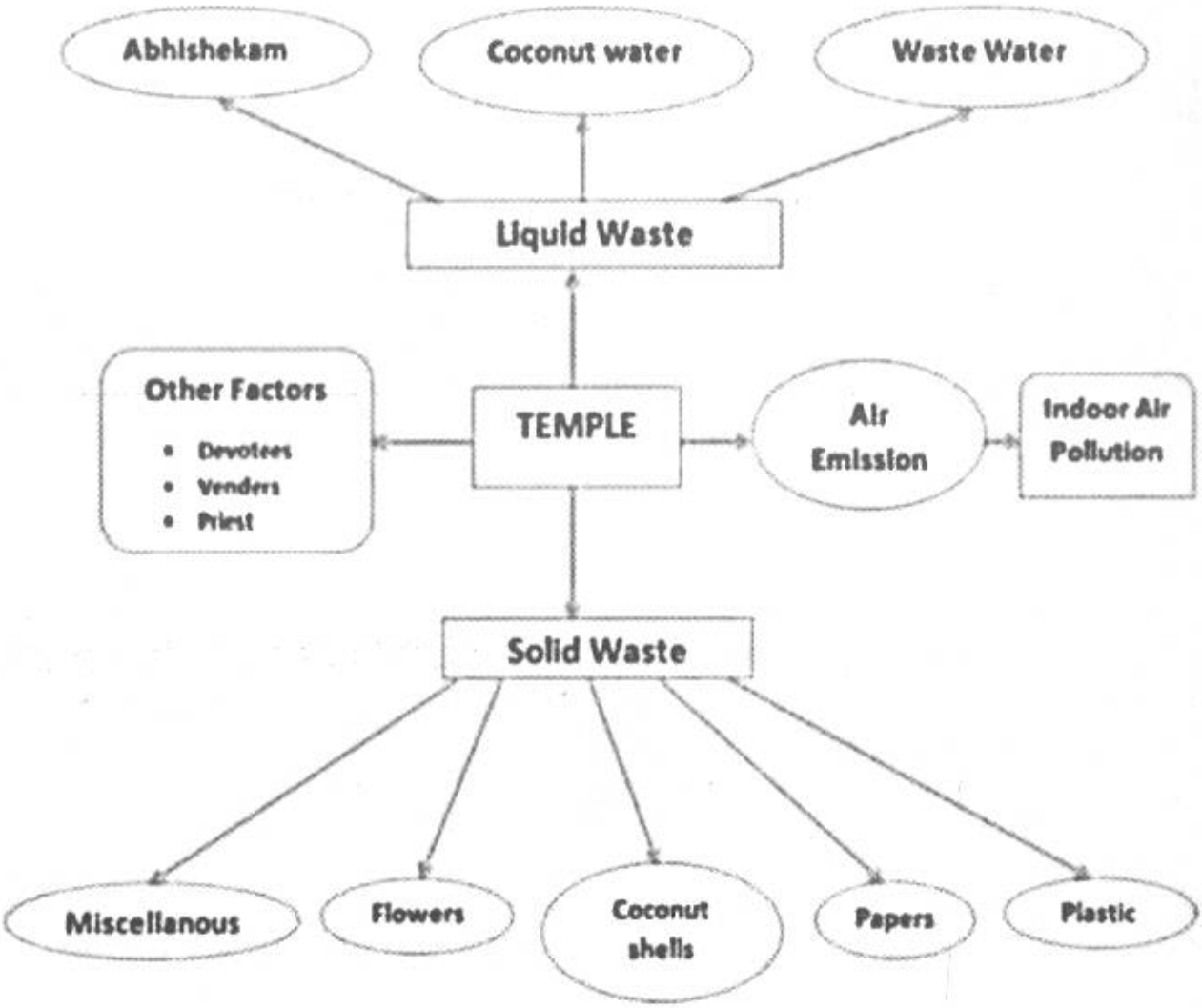
3 To highlight the importance of preserving the cultural and religious significance of temples while implementing waste management initiatives.

Types of waste extracted from Temples in India

Temple waste generation is a major issue in both developed and developing nations due to its detrimental effects on the environment. Inadequate trash collection at the source, poor

management, and a variety of cultural and societal customs that have been followed for ages all have a negative impact on India. Numerous puja gifts, particularly in Indian temples, produce trash such flowers, fruits, garments, leaves, coconuts, and other food wastes.

Figure 1: Shows elements of temple waste commonly observed in India



Source: https://www.researchgate.net/publication/355645278

Wastes arising from temples can be categorized as liquid, solid, and gaseous (air emissions). The everyday garbage produced at temples and other sacred sites increases the intricacy of the waste, making it more difficult for the local organizations to manage and get rid of it. During the busiest holiday seasons and pilgrimage events, garbage volumes and complexity rise. Through urbanization, which raised the amount and complexity of trash produced in cities, modernization and economic development have raised people's standards of living.

India is a country with a rich cultural heritage that observes festivals regularly and practices rigorous religion. Large amounts of flowers are thrown away as waste in temples, mosques, churches, dargahs, gurudwaras, hotels, banquet halls, and homes under this practise. In India, every year, some 8 million tonnes of floral waste are thrown into rivers and other bodies of water, choking and poisoning them and degrading the ecosystem. Flowers are

offered to God and are not disposed away through the regular garbage disposal procedure.

The procedure of the temple waste management degrading is quite slow

Most religious places do not have appropriate disposal methods for the majority of flowers, plant leaves, coconut shells, milk, and curd, thus these materials are disposed of at random in a number of public locations. The World Health Organization determined in 2005 that 36 percent of the pesticides used in flower plantations were extremely toxic and might negatively impact health by causing skin rashes, eye issues, and respiratory issues. It takes a lot for someone to stop for even a few moment to consider what happens to this rubbish. Rather of being indifferent to the harm done to the environment, a solution that works for all of India's religious institutions must be created.

Problems associated with improper waste disposal

Improper temple waste disposal can lead to various problems, including:

1. **Environmental Pollution**: Dumping waste indiscriminately can pollute soil, water bodies, and air, leading to environmental degradation and health hazards for wildlife and ecosystems.
2. **Public Health Risks**: Improperly managed waste can attract pests, rodents, and disease-carrying organisms, increasing the risk of infections and illnesses among temple visitors and nearby residents.
3. **Aesthetic Degradation**: Accumulation of waste around temples detracts from their aesthetic appeal and cultural significance, diminishing the spiritual experience for devotees and visitors.
4. **Odor and Nuisance**: Rotting organic waste and stagnant water from improper disposal can produce foul odors and create a nuisance for both temple-goers and local communities.
5. **Contamination of Offerings**: Improperly disposed waste, such as plastic wrappers and non-biodegradable materials, can contaminate offerings made to deities, compromising the sanctity of religious practices.
6. **Groundwater Contamination**: Leachate from landfills or unlined waste disposal sites can contaminate groundwater, posing long-term risks to water quality and human health.
7. **Legal and Regulatory Issues**: Failure to comply with waste management regulations can result in legal penalties, fines, and damage to the reputation of temples and religious institutions.
8. **Loss of Biodiversity**: Improper waste disposal practices can harm local flora and fauna, disrupting ecosystems and contributing to biodiversity loss.

Addressing these problems requires implementing effective waste management strategies, promoting awareness among temple stakeholders and visitors, and adhering t

Findings and Solution:

Green Temple waste management

Temple material can be used to create a variety of goods:

1. **Flower waste management**

   Flowers are extensively cleaned and sun-dried in various locations. They are ground into a powder and combined with real raisins to form a dough that is then used to create handmade, roll-out herbal incense sticks. Another great and environmentally beneficial method for managing floral debris is vermicomposting.

2. **Coconut Shells waste management**

   When coconut shells are burned for three hours outside, they produce coconut shell ash, which can be used in place of some cement. Granite can be replaced with coconut shell.

   Additionally, floral waste can be used as a sustainable supply of raw materials for the manufacture of handmade paper. These sheets are completely devoid of wood and other dangerous substances, therefore

Dry mahua flowers can be used to make sugar syrup, while marigold flower extract can be utilized as an additive in the food industry and in veterinary feeds. Certain floral oils have therapeutic significance. For example, calendula oil is an excellent source of massage oil, lilies can treat jaundice, and madhuca can heal bronchitis.

Community Engagement and Public Awareness

1. **Educational Campaigns**: Develop educational programs and campaigns to raise awareness about the importance of proper waste disposal and recycling practices among temple visitors, staff, and nearby communities.
2. **Partnerships with NGOs**: Collaborate with non-governmental organizations (NGOs) that specialize in environmental conservation to conduct workshops, seminars, and awareness drives focused on waste management.
3. **Interactive Workshops**: Organize interactive workshops and demonstrations within temples to teach people about waste segregation, composting, and recycling techniques.
4. **Community Clean-up Events**: Arrange periodic clean-up drives involving local residents, volunteers, and temple devotees to keep temple premises and surrounding areas free of litter and waste.
5. **Information Dissemination**: Use signage, brochures, and digital platforms to provide information about waste management guidelines, recycling bins' locations, and the impact of responsible waste disposal on the environment.
6. **Incentive Programs**: Introduce incentive programs such as rewards or recognition for individuals or groups who actively participate in waste reduction and recycling initiatives.
7. **Youth Engagement**: Engage youth groups, schools, and colleges in sustainability projects related to temple waste management. Encourage them to take leadership roles in promoting eco-friendly practices.
8. **Feedback Mechanisms**: Establish feedback mechanisms to gather input from the community on waste management initiatives, address concerns, and incorporate

suggestions for improvement.

By implementing these strategies, temples can foster a culture of environmental consciousness, empower communities to take ownership of waste management, and contribute to a cleaner and more sustainable environment.

Recommendations for policy-makers and temple authorities to enhance waste management infrastructure, regulations, and educational programs:

1. **Infrastructure Improvement**:
   - Invest in modern waste management infrastructure such as waste segregation bins, composting facilities, and recycling centers within temple premises.
   - Implement efficient waste collection and disposal systems to ensure timely removal of waste and prevent accumulation.
   - Consider installing renewable energy technologies like biogas plants to convert organic waste into energy, reducing environmental impact and promoting sustainability.
2. **Regulatory Framework**:
   - Develop and enforce strict regulations and guidelines for waste management in temples, including penalties for non-compliance to encourage adherence to best practices.
   - Collaborate with local authorities and environmental agencies to align temple waste management policies with national and regional waste management frameworks.
   - Establish monitoring mechanisms to track waste generation, disposal practices, and compliance with regulations, enabling data-driven decision-making and accountability.

By adopting these recommendations, policy-makers and temple authorities can create a conducive environment for sustainable waste management practices, foster collaboration among stakeholders, and promote a culture of environmental responsibility within temple communities.

Conclusion:

Temples serve as centers for religious and spiritual activities, preserving ancient rituals, prayers, and ceremonies that have been passed down through generations. These practices are essential for maintaining cultural continuity and spiritual connection. Temple waste management plays a vital role in promoting environmental sustainability, public health, cultural preservation, community engagement, resource conservation, and educational awareness, aligning with broader goals of sustainable development and ethical practices. This paper emphasized the importance of Engaging temple staff, volunteers, and devotees in waste management initiatives as it fosters a sense of environmental responsibility and community ownership. It promotes collaboration, awareness, and collective action towards sustainable practices. Secondly proper waste management in temples promotes resource conservation by recycling materials such as organic waste for composting, reusing items like flower offerings for religious purposes, and minimizing unnecessary waste generation. In summary, temples are not just religious institutions but also custodians of cultural heritage,

art, traditions, and community cohesion. Their preservation is essential for maintaining cultural diversity, promoting intergenerational knowledge transfer, and fostering appreciation for cultural values and identity.

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CONTEMPORARY ISSUES AND TRENDS IN DIGITAL MARKETING

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OSMOSIS MARKETING: A TOOL OF SOCIAL MEDIA MARKETING TO BUILD NEW CUSTOMER BASE

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ABSTRACT

Social media sites are the communication links that bring people together. According to studies, individuals are increasingly turning to social media to gain access to information, ideas, and opportunities. Social media technology has changed the way companies and customers manage their relationships. Social media is changing the face of online marketing, communication and promotion. Over 3 Billion social media users are listening, talking, learning, buying, selling and connecting. With a focused and measured social media strategy, a business can maximize exposure, grow audiences, targets customers, market your brand and sell your products and services worldwide. Osmosis marketing is the idea that any brand's image and resulting success is achieved more effectively through the osmosis of pervasive blog buzz and tweet-trending than traditional marketing methods. It must be noted that this term should not be confused with the marketing used by Osmosis Media Group. It became essential to understand the role of osmosis marketing in the online marketing sector as its significant use was seen in the last two year after Covid-19. This study has focused on the need of social media marketing in current scenario. The objective of this research has been to determine whether Osmosis marketing is really an influencing factor on online marketing and to determine the correlation coefficient between Global online Advertisement Market size and Global Market size of traditional marketing. Research is based on secondary data and Quantitative Research Methodology has been followed. A Pearson correlation coefficient is used to quantify the linear

association between two variables, Global online Advertisement Market size and Global Market size of traditional marketing. To determine if the correlation coefficient is statistically significant, t-test is performed, which involves calculating a t-score and a corresponding p-value. Null Hypothesis has been assumed that the correlation between the two variables is statistically insignificant. The study so conducted rejected our Null Hypothesis. It has proved that there has been a statistically significant negative correlation between Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $) Research has concluded that social media marketing is one of the most important factors in the survival, growth, and success of small and/or new businesses, although this type of marketing is typically informal and unstructured. By regular updating the right social media marketing strategy, it will lead to increased traffic, better SEO, improved brand loyalty, healthier customer satisfaction and much more.

Key Words: Osmosis Marketing, Social Media, Contemporary Entrepreneurs, Global Traditional Marketing size, Global Online Marketing

I. INTRODUCTION

The emergence of new information and communication technologies, notably the Internet and social networks, has altered market dynamics, endangered corporate competitive positions and strengthening consumer power. The Internet and online social media have altered consumer consumption patterns by giving new means for customers to search for, evaluate, choose, and purchase products and services. These innovations have an impact on how marketers' function and alter marketing practices in terms of both strategy and tactics by posing new difficulties and difficult choices to marketers. Social media is generally defined as internet-based technology applications that, in line with Web 2.0 principles, enable the creation and exchange of user-generated content while simultaneously encouraging interaction and cooperation among users. Blogs and microblogs (such as Twitter), social networking sites (such as Myspace and Facebook), virtual worlds (such as Second Life), collaborative projects (such as Wikipedia), content community sites (e.g., YouTube, Flickr), and feedback sites (e.g., online forums) are further examples of such applications. Social media sites are the communication links that bring people together. According to studies, individuals are increasingly turning to social media to gain access to information, ideas, and opportunities. Social media technology has changed the way companies and customers manage their relationships. The success of social media stems from the fact that it has offered a means for people to engage with one another. Marketers are utilizing social media networks to promote their companies. They use social media to understand client expectations and then create relevant methods to promote their services in order to achieve the marketing goal. Communication is highly important and beneficial for starting the talks. Furthermore, communication is the single technique utilized to begin, build, and sustain a relationship between two people. Communication opens the path to understanding and eradicating misunderstanding. Social media provides as a platform for communication and engagement with a wide range of customers.

Companies may use this media to increase brand recognition. Social media marketing is a new and fast increasing method for businesses to effortlessly reach out to targeted clients. Social media marketing is essentially the use of social media networks to promote a business and its products. This type of marketing is a subcategory of online marketing activities that complement standard Web-based promotion tactics like e-mail newsletters and online advertising campaigns. Social media marketing has introduced a new concept of exponential dissemination and trust to mass communication and mass marketing by encouraging users to share messages to personal contacts. This new approach to outreach and marketing is resulting in the development and expansion of new tools for businesses. A business news website named entrepreneur.com released a list of jargons and buzzwords related to entrepreneurship in which a term osmosis marketing was used which is a very new term and is emerging as a new subset of social media marketing. This has become popular amongst the new generation entrepreneurs. This term was coined in 2010 when Robbie (an active blogger) said "Forget traditional marketing methods--if osmosis marketing worked for Justin Bieber, it'll work for you". However, its rapid use was reportedly seen in the year 2020-21 with a boom in the impact of social media influencers. Osmosis marketing is the idea that any brand's image and resulting success is achieved more effectively through the osmosis of pervasive blog buzz and tweet-trending than traditional marketing methods. It must be noted that this term should not be confused with the marketing used by Osmosis Media Group.

1. NEED FOR THE STUDY

It has been observed that there are numerous claims regarding increase in online marketing as compared to sharp decline in traditional marketing, however the latest studies available are related to the year 2020 which leads to a research gap and raises a question, whether this increase was temporary and due to Corona Virus pandemic or the existing and new entrepreneurs are really inclined towards online marketing. In addition to above mentioned situation, it became essential to understand the role of osmosis marketing in the online marketing sector as its significant use was seen in the year 2020-21 and to verify that osmosis marketing is really a factor influencing the online marketing sector.

2. LITERATURE REVIEW

According to Kaplan and Haenlein (2010, 61) social media are "a series of Internet-based applications that expand on the theoretical and technological underpinnings of Web 2.0, and enable the creation and exchange of user created content,"

Thackeray et al. (2008-2011) suggest that Social Media Marketing will enable health practitioners to develop direct relationships with their clients. As a result, health promotion planners should use all of their creativity to incorporate Social Media Marketing into their strategies in order to fully capitalize on its marketing potential.

Pookulangara and Koesler (2011) draw the conclusion that culture does affect how people behave and view an event on technology-based applications, such as social media, based on the research model. This implies that how a person interprets social media and its content will depend on their cultural or racial background. Social networking has facilitated the emergence of a new culture that is now influenced by new values and ideas as well as individual ones. Given that social networks are a blending of many cultures and the development of new online cultures, retailers using social media should be aware of the significance of culture (Pookulangara and Koesler 2011). Additionally, a consumer's view and attitude toward a brand or product may be influenced by cultural customs and origins.

According to Heinonen (2011), retailers and marketers must be aware of the elements influencing customer attitudes and motivations since people are increasingly producing brand-related material, which was previously under the exclusive control of businesses. According to Cox (2010), who had looked at the relationship between attitude and age found that the attitudes of social network users toward online advertising forms (such as blogs, videos, and brand channels or pages) varied to some extent among age groups. According to her, users between the ages of 18 and 28 had overwhelmingly favorable opinions on blogs, videos, and brand channel ad formats. This was due to people finding these ad forms to be interesting, entertaining, and eye-catching. Because they thought they were more attention-grabbing, informative, and had better placement, the 35-54 age groups favored the ad formats on video and brand channels. Users generally accept online advertising formats with beneficial qualities; nevertheless, obtrusive or interfering advertisements, such as pop-up, expandable, or floating style advertisements, are loathed by network users.

Taylor, Strutton, and Thompson (2012) discovered that the drive for self-enhancement is also connected to social media users' message sharing practices. Customers are more inclined to share a message with others when they believe an online advertisement to be congruent with who they are as a person and what they enjoy. Advertising professionals "should evaluate the symbolic and self-expression qualities of their web advertising and match them to targeted customers' self-concepts," the authors write (Taylor, Strutton, and Thompson 2012, 13). In other words, a company's marketing strategy must reflect the interests of its target market. All of these research' conclusions demonstrate the importance of CGA and its bearing on internet marketing.

According to **Zhang, Jansen, and Chowdhury (2011)** To expand their customer base, firms should have a strong online presence across a variety of social media platforms. As stated in Zhang, Jansen, and Chowdhury (2011), "Research has demonstrated that exposure to electronic word of mouth (eWOM) communications can stimulate greater interest in a product category than exposure to material provided by marketers." (Birkart and Schindler, 2001). Due to the internet's ability to provide customers with information and make them active co-producers of value, consumers are now better informed about the items they use

and since consumers are co-creators of value, they may provide businesses a high return on investment by raising brand recognition, demonstrating the significance of eWOM in modern marketing.

3. RESEARCH METHODOLOGY

Data used is secondary and is collected from Global Data, an online open-source database depicting Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $) for the financial years from 2017-2021. A Pearson correlation coefficient is used to quantify the linear association between two variables (Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $))

It always takes on a value between -1 and 1 where:

- -1 indicates a perfectly negative linear correlation.
- 0 indicates no linear correlation.
- 1 indicates a perfectly positive linear correlation.

To determine if the correlation coefficient is statistically significant, t-test is performed, which involves calculating a t-score and a corresponding p-value.

The formula to calculate the t-score is:

$t = r\sqrt{(n-2)} / (1-r2)$

where:

- r: The correlation coefficient
- n: The sample size

The p-value is calculated as the corresponding two-sided p-value for the t-distribution with n-2 degrees of freedom.

4. OBJECTIVES

- To determine the correlation coefficient between Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $)
- To determine the statistical significance of the correlation coefficient calculated.
- To determine whether Osmosis marketing is really an influencing factor on online marketing.

Hypothesis

H0= The correlation between the two variables is statistically insignificant (i.e., p value > level of significance at 0.10)

H1= The correlation between the two variables is statistically significant (i.e., p value < level of significance at 0.10)

5. DATA ANALYSIS AND INTERPRETATION

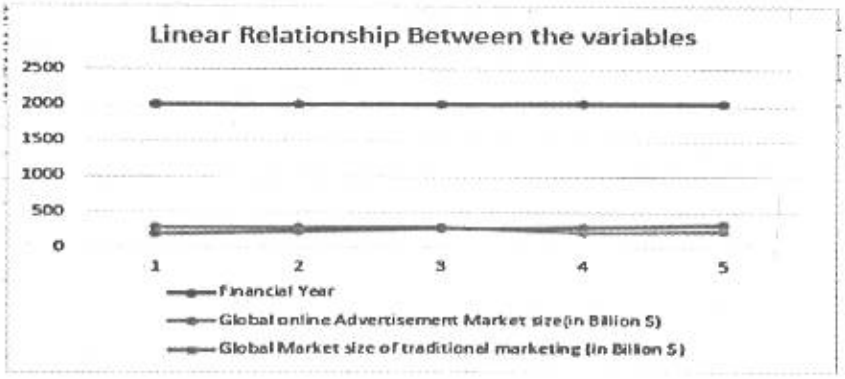
Table 1: Global Market Size of Marketing Sector

Financial Year	Global online Advertisement Market size(in Billion $)	Global Market size of traditional marketing (in Billion $)
2017	200	297
2018	234	289
2019	267	280
2020	280	225
2021	318	239

Interpretation-

From the above table it is evident that there is a constant increase in the global online marketing and regular decrease in global traditional marketing .It could also be interpreted that when in 2017 the global marketing sector was of 497 Billion dollars more than 50% was captured by the traditional marketing however the gradual shift towards the online marketing resulted in online marketing to capture more than 50% of the total market. A Pearson correlation coefficient is used to quantify the linear association between two variables (Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $)) The coefficient of correlation calculated using MS Excel (=PEARSON (B2:B7, C2:C7) is -0.82453.This shows a strong negative correlation between the two variables undertaken for study.

Graph 1: Linear Association between the two variables.



From the above data it could be inferred that the increasing rate was decreasing for online marketing till year 2020 but witnessed a rise in increasing rate in the year 2021, which is the same year in which osmosis marketing was introduced and used on a large scale. The global online marketing saw an increase of 17% in 2018 from 2017, an increase of 14% from 2018 to 2019 and merely an increase of 4.86% from 2019 to 2020. However, there was 13 % increase in the year 2021 from 2020.

Correlation value (r): -0.8245

Sample size: 5

t-value: -2.52371781

Degrees of freedom: 3

Interpretation-The T score or T value calculated is -2.5235 with degree of freedom at 3 and significance level being 0.10. The p value thus calculated is .08618 which is less than level of significance.

This shows that the correlation between these two variables is statistically significant.

6. FINDINGS

The existing and new entrepreneurs are shifting from traditional marketing to online marketing as there is no denying that social media marketing has many advantages for startups and established brands. By regular updating the right social media marketing strategy, it will lead to increased traffic, better SEO, improved brand loyalty, healthier customer satisfaction and much more. Osmosis marketing played a significant role in online marketing segment and changed the trend of declining increasing rate to rising increasing rate evident from the data of 2021 as compared to other previous years. The study so conducted proved that there has been a statistically significant negative correlation between Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $) of -0.8245. The T score calculated after applying Student's T test was -2.52371. The test was conducted at 0.10 significance level and p value calculated using MS Excel was 0.08618 which showed that the correlation is statistically significant.

II. CONCLUSION

It can be concluded from the study that there is a strong negative correlation between the two between Global online Advertisement Market size (in Billion $) and Global Market size of traditional marketing (in Billion $) of -0.8245and the statistical significance of the correlation thus calculated is determined to be significant as p value < level of significance {0.08618 <0.10}. Hence the null hypothesis is rejected and alternate hypothesis is accepted. The correlation between the two variables is statistically significant (i.e., p value < level of significance at 0.10). According to the study, social media marketing is one of the most important factors in the survival, growth, and success of small and/or new businesses, although this type of marketing is typically informal and unstructured. Little advance planning is required since it is believed to be a managerial trend that must just be accepted. The majority of owner-managers utilize social media in a reactionary manner and are resistant to change. Osmosis

marketing, a subset of social media marketing, is a crucial and useful instrument for entrepreneurial marketing tactics. Entrepreneurs that utilize social networks and groups on their own initiative and without using this term as a buzzword claim to have improved their online reputation and image.

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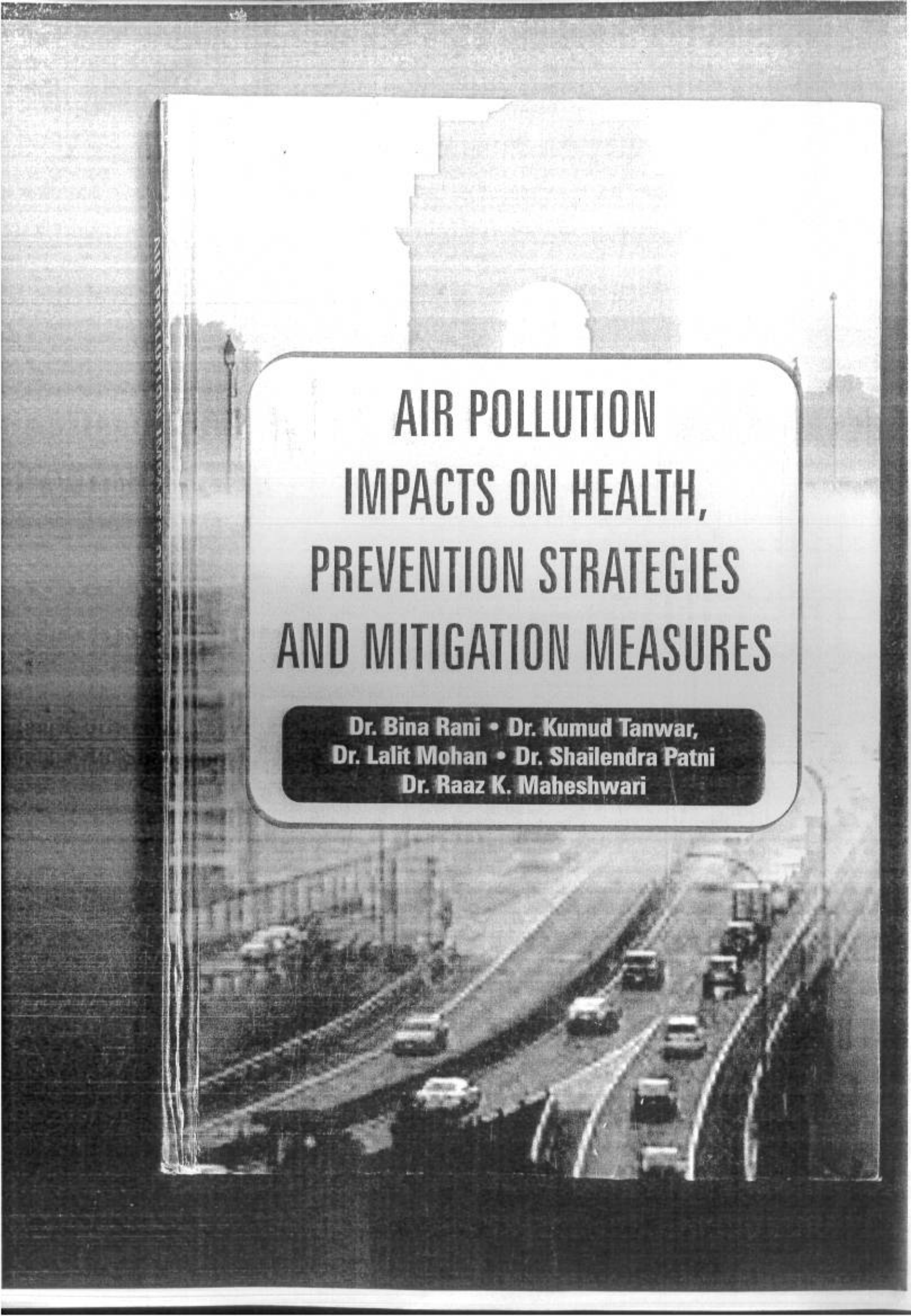
AIR POLLUTION IMPACTS ON HEALTH, PREVENTION STRATEGIES AND MITIGATION MEASURES
Dr. Bina Rani • Dr. Kumud Tanwar,
Dr. Lalit Mohan • Dr. Shailendra Patni
Dr. Raaz K. Maheshwari

AIR POLLUTION IMPACTS ON HEALTH, PREVENTION STRATEGIES AND MITIGATION MEASURES

The National Capital Territory (NCT) of Delhi has seen rapid growth in its industrial, transportation, and housing sectors over the past decades. The population of Delhi has increased from 1.378 crore in 2001 to 1.678 crore in 2011, a decadal growth of 21.2% against a national growth rate of 17.7%. This rapid growth in population, along with the increased rate of industrialization and urbanization and the rise in motorized transport, have resulted in an increased concentration of various air pollutants such as nitrogen oxides, sulphur dioxide, suspended particulate matter, respirable suspended particulate matter, carbon monoxide, ozone, lead, benzene, hydrocarbons, etc. With rising concerns about the steep increase in air pollution in the National Capital Territory of Delhi, several factors particularly motorized transportation, construction, and stubble burning in neighboring states are being identified as contributing to this hazard.

The present book includes Air Pollution impacts and control measures, Air Pollution in Mega City-Delhi NCR, understanding towards Delhi's complex Air Pollution Problem and their sources, impact of urbanization on Air Pollution in Asian Cities, Impacts of Air Pollution on the ecosystem and human health, Indoor Air Pollution sources, impact on health & remediation, recent trends in the control and improvement of Indoor Air Quality, regional and global level environmental problems of Air Pollution.

CONTENTS

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Preface

The sixth mass extinction on the earth is being caused by humans. The start of the Anthropocene Epoch is shown by this. Many more species are predicted to become extinct as a result of human activity, global warming and climate change.

Although "global warming" and "climate change" are sometimes used synonymously, they refer to different aspects of the same phenomenon. The term "global warming" describes the planet's gradual warming. Since the early 20th century, there has been a well-documented rise in the average global temperature. Global warming is included in "climate change," but it also refers to a wider variety of changes that are taking place to our planet. These include changes in flower/plant blooming seasons, dwindling mountain glaciers, accelerated ice melt in Greenland, Antarctica, and the Arctic, and rising sea levels. All of these are effects of warming, which is mostly brought on by people burning fossil fuels and releasing heat-trapping gases into the atmosphere.The emissions of three main greenhouse gases—carbon dioxide, methane, and nitrous oxide have had a greater cumulative impact on the climate since around 1750 than the sum of emissions from anthropogenic and non-anthropogenic sources for the previous 10,000 years, according to the IPCC-AR4.

The Covid -19 halted climate change's relentless advancement but did not slow it down. Impacts of climate change on the world. Humans have tragically ignored environmental concerns despite having made great development gains. Natural disasters are sometimes referred to as "acts of God" by the general public and decision-maker. Developing country like India is the most affect country in Asia due to climate change and global warming. It has the highest social cost of carbon and may lose anywhere around 3–10% of its GDP annually by 2100 and its poverty rate may rise by 3.5% in 2040 due to climate change. India has about 75% of area near the coastline and rising water level in ocean will affect those cities. One major problem is of municipal landfills which produces harmful gases. Several augmentation techniques are being tried in this situation to encourage the biological activity in the landfills.

Many initiatives have been taken on international platform and India has participated actively. Such as UNFCCC, Kyoto Protocol, Montreal Protocol, Paris Climate Deal, etc. Whereas India have its

own initiatives. Under NAPCC India has 8 missions and along with those in COP26 India has taken a stand and spoken out unambiguously, demonstrating that emerging countries are ready to make climate change-related decisions. When compared to historical duties in connection to the pace of emissions of various regions of the world, India's response is significantly superior than that of the industrialized world.

One of the major development took was the popularity of Green Chemistry. Green chemistry (GC) is defined as durable and environmentally responsible chemistry. It involves developing chemical goods and procedures that lessen the possibility of manufacturing harmful compounds. It considers each phase of a chemical product's life cycle, including manufacture, use, design, and disposal. Green chemistry appears to have the ability to reduce the negative effects of chemical products on the environment and human health, provide original scientific solutions, and assist in the molecular level prevention of environmental damage. It is a revolutionary philosophy that aims to bring together business, education, and the government.

Editors

Contents

IMPACTS OF CLIMATE CHANGE

K.C. Sharma[*] and G. P. Acharya[†]

Although there has always been some degree of climate change on Earth, the current rate and magnitude are very alarming. An inequity in the amount of sunlight entering and leaving the atmosphere is what leads to climate change. Climate change is causing global warming at a different rate than it did in the past. The average global temperature is forecast to increase through up to 5.4°C by 2100. There is abundant evidence showing that human actions have made a contribution to climate change, despite the fact that that variability in sunspot activity and volcanic activity have only slightly affected over the past century. And over past few decades, humans have significantly altered natural systems, which has led to an overall rise in carbon dioxide in the atmosphere.

Climate, from the Early greek Greek "klima" (which connotes inclination), is the term that refers to the weather conditions on an average over such a prolonged period of time (with the standard period of 30 years). The geographical documentation of climatic changes is supported by numerous thermal and precipitation monitoring sites dispersed throughout the globe.

Comparing Global Warming and Climate Change

The phrases "climate variation" and "global temperatures" are frequently used interchangeably, despite the fact that they refer to distinct physical procedures and have various interpretations. The term "global warming" only refers to the gradual rise in the Earth's mean surface temperature; however, the term "changing climate" also refers to the warming's adverse effects, such as more intense precipitation and brisk winds.

Climate Change Causes

By consuming fossil fuels, destroying forests, and raising livestock, humans are having a greater impact on the earth's

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INDIA IS DEALING WITH CLIMATE CHANGE

Divyanshi Pareek[*], *Kumud Tanwar*[†] *and Swati Singh*[‡]

Abstract

Climate change is one of the world's most important problems right now. Unmistakably demonstrating our vulnerability to climate change are recent events. A wide range of effects will result from climate change, including disruptions to agriculture (thus jeopardizing food security), sea-level rise, accelerated coastal zone erosion, an increase in the frequency of natural disasters, the extinction of species, and the spread of vector-borne diseases. India unveiled its eagerly awaited National Action Plan on Climate Change (NAPCC) to mitigate and adapt to climate change on June 30, 2008, nearly a year after it was initially announced. The NAPCC, which flows through 2017, stipulates that by December 2008, ministries must submit comprehensive implementation plans to the Prime Minister's Committee on Climate Change.

India's Climate change

India has raised concerns about the UN's (UN)[1] haste to declare climate change a global security issue, potentially giving the Security Council the power to take action, and has highlighted the flaws in the strategy.

According to India, the Paris Agreement and multilateral efforts to find solutions would be in jeopardy if the "simple Council decision"[2] were to take over the enforcement of climate change.

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Security in the twenty-first century is threatened globally by climate change. To reduce future threats to the earth we share and also the desired peace, we must take immediate action.

What is Climate Change?

Climate change is the term used to describe how the Earth's climate changes on a regular basis as a result of changes in the atmosphere and the interactions in between atmosphere and various geological, chemicals, biological, and geographic factors. [3]

Factors Affecting Climate Change

Natural Factors

Over the course of thousands to millions of years, influence the climate. As an illustration, continental drift was created when plates began to drift apart millions of years ago. Climate change is affected by the physical characteristics as well as placement of the landmass, the placement of bodies of water, including ocean currents and winds, as well as other factors.

Volcanism Volcanic eruptions produce gases and dust mites that linger for a longer duration of time, usually causes a temporary blockage of the Sun's rays and influencing weather patterns.

Alterations in Earth's Orbit- The seasonal allocation of sunlight that reaches the surface of the Earth around the globe is impacted by minute variations in the Earth's orbit. There are three different types of orbital variability: changes in the eccentricity of the Planet, changes in the tilt of the Earth's axis, and changes with in precession of the Earth's axis. The combination of these can result in Milankovitch cycles, that are known for their connection to the interglacial as well as glacial periods and significant influence on climate.

Anthropogenic Factors

Is primarily due to a rise in the global surface temperature caused by humans. Greenhouse Gases, for example. These absorb solar heat radiation, raising global temperatures as a result. GHGs primarily don't absorb sunlight, but they do absorb most of the infrared that the Earth's surface releases into the atmosphere[4]. Global

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Zero-Day Exploits: Exploring the Concept of Zero-Day Vulnerabilities and their Implications

Authored by

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ACCEPTANCE FOR PUBLICATION

Dear

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Greetings of the Day!

Your paper " **ZERO-DAY EXPLOITS: EXPLORING THE CONCEPT OF ZERO-DAY VULNERABILITIES AND THEIR IMPLICATIONS** " has been accepted for publication in Edited Book INFORMATION TECHNOLOGY A MODERN APPROACH TO DIGITAL INDIA & CHALLENGES IN

THE MANAGEMENT OF COMPENSATION IN THE BANKING SECTOR

Abstract

The chapter provides a comprehensive examination of the management of compensation in the banking sectors. Singlemindedness of the study is to ascertain how compensation affects employee productivity as well as how satisfied and how they feel about it.It delves into the approaches, tasks, and best practices connected with compensation management, addressing the unique characteristic and adjusting countryside of the banking industry. The training of compensation management provides a summary of employee compensation in the Banks, explains the employee incentive system, and assesses how well employees perform at their jobs. The various compensation components, counting base salary structures, performance-based incentives, executive compensation, and employee benefits. You practically don't have to manage them if you choose the proper individuals, offer them the chance to fly, and provide remuneration as a carrier. The determination of this training is to increase understanding of the Compensation Management system in the banking industries. Therefore, comprehending it will aid in determining the significance of Compensation from the viewpoint of HR.

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COGNITIVE COMMERCE: EXPLORING AI'S INFLUENCE ON BUSINESS MANAGEMENT

Abstract

AI's influence on today's business management is undeniable, as it continues to reshape the way companies operate and make decisions. From data-driven decision-making to personalized customer experiences and supply chain optimization, AI has become an indispensable tool for modern businesses. Embracing AI technologies and leveraging their capabilities will be crucial for businesses to stay competitive and thrive in an ever-evolving market. As AI continues to advance, its potential to drive innovation and efficiency in business management will only grow, presenting new opportunities and challenges for organizations worldwide. Combining the strengths of AI and human support can lead to a truly exceptional and personalized customer service experience. On the other hand, it is advisable that businesses embracing AI technologies with ethical principles and data privacy considerations can harness the full potential of cognitive commerce, creating a sustainable competitive advantage and delivering exceptional customer experiences in the fast-evolving market.

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CH-128: Digital DBMS using IoT

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The emergence of the Internet of Things (IoT) has brought about a significant transformation in several industries by permitting smooth communication and astute automation. Of all the applications, database management systems (DBMS) have shown to have one of the most revolutionary effects. When real-time data collecting, processing, and analytics come together with digital database management systems and Internet of things technologies, it creates a paradigm shift that improves decision-making, efficiency, and scalability. This chapter explores the architecture, advantages, difficulties, and potential applications of Digital DBMS in the Internet of Things ecosystem.

1. Architecture of Digital DBMS in IoT

In the context of the Internet of Things, the design of Digital DBMSs (Database Management Systems) is a sophisticated framework wherein the capabilities of IoT devices converge with traditional database management concepts. Real-time data processing, analytics, and decision-making are made easier by this integration, which is revolutionizing a variety of industries, including manufacturing, healthcare, smart cities, and agriculture.

Parts and Organization

Fundamentally, the architecture of Digital DBMS in IoT consists of multiple crucial parts that are highly integrated to guarantee smooth functioning and effective data processing.

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Efficient Models for Detecting Monkeypox using Skin Lesion Images

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Abstract: **Monkeypox is predicted to be the next pandemic and is spreading over African countries like water under a mat. The study basically investigates three deep learning imaging models for the identification of monkeypox from skin lesion photos from the MSID dataset. The motto is to define a computer-based technique to identify monkeypox from just its image, making it cheaper and faster with accurate results. The study achieved the highest accuracy of 99.37% as compared to previous works related to Resnet 50. The limits and complexity of the procedures in real-world situations are also clearly addressed.**

Keywords—Monkeypox, Convolutional Neural Network, Transfer learning, Image preprocessing, Performance Evaluation Metrics

I. INTRODUCTION

The monkeypox virus is the cause of the uncommon zoonotic illness that has gained international attention. Its transmission from animals to humans—as well as occasionally from human-to-human contact—highlights the significant need for efficient detection techniques. This study examines how monkeypox detection has changed over time, from conventional laboratory methods like electron microscopy, histopathology, serological testing, RT-PCR, and immunohistochemical methods to some advanced computerized technology like advanced image analysis techniques. It is essential to identify cases quickly and accurately in order to put public health measures in place on time to stop the virus's spread, mainly in rural areas. Researchers, medical professionals, and legislators may work together to improve surveillance and diagnostics by knowing the advantages and disadvantages of current methods. This will support international efforts to contain and stop monkeypox outbreaks.

This work uses the selected MSID dataset to assess Resnet50, Efficientnet B0, and Alexnet for monkeypox detection. In order to increase model accuracy and avoid overfitting or underfitting, it tackles generalization problems and implementation mistakes using preprocessing and augmentation approaches. The work aims to achieve human-level performance and outperforms prior literature results, with Resnet50 obtaining the best training and testing accuracy with the least amount of loss. A thorough analysis highlights the research's importance as a major contribution to the field and demonstrates the effectiveness of deep learning models in the identification of monkeypox. The study tries to finally achieve accurate results with decreased costs and improved portability of testing equipment. The research gap this study has chosen to address based on the review made is the development of computerized monkeypox detection techniques with best accuracy and reliability. The results also describe the prefereability of CNN models over each other and rate of detection at which each model is performing to speed up the detection process.

Section 2 reviews the monkeypox detection literature, emphasizing research gaps. Section 3 outlines method models along with datasets, augmentation, and preprocessing. Section 4 covers implementation details, including experimental setup and result analysis. In Section 6, the study proposes hypotheses for future researchers, explores model applications, and acknowledges limitations affecting performance following conclusion.

II. LITERATURE REVIEW

Authors Guobin Zhang [1] and Krit Sriporn [2] performed uuNet and Mobilenet, Resnet50, and Denscnet121 models, respectively, on lung tumors with better DSC metrics. Buyut Khoirul Umri and Kusrini Kusrini performed the CLAHE method on COVID-19 X-ray images with an accuracy of 96% [3]. Research conducted on the histopathological image Breakhis dataset published in Applied Soft Computing journal by M. Saini and S. Susan proposed a novel approach for the imbalanced breast cancer dataset. The lower level of the built-in deep networks consists of VGG16 layers that

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PREFACE

This edited volume, "**Innovative Business Practices for Sustainable Development,**" aims to support academics' and students' research and learning activities in the social sciences, economics, global business, and economics. Its goal is to encourage these fields' usage and comprehension of scientific research procedures.

The goal of this edited book is to support and elevate the scholarly research contributions made by scholars in the management, economics, and commerce domains. It seeks to give researchers, businesspeople, and academics a respectable stage on which to present their work. The writing style of the book is simple and conventional.

We sincerely hope that this book will sufficiently serve the demands of scholars studying business, management, and economics.

Since mistakes are unavoidable, we will appreciate it if they are pointed up to us ahead of time. We anticipate that the previously suggested modifications will be incorporated into subsequent iterations.

We sincerely appreciate the support that each and every academic, researcher, and business worker who has worked on this project has given us. We especially like to thank the writers and reviewers who have contributed actively to the review process. Without the tremendous assistance of numerous people, this edited book would not have been possible to realize.

We would like to sincerely thank our family, friends, and well-wishers for your timely and crucial support and encouragement.

We would like to acknowledge and be grateful to **Universal Research Academy** who gave us an opening in writing this book and their involvement to make this publication successful.

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Research Article

Green Supply Chain Management Practices in Higher Educational Institutions: A Comprehensive Review of Research and Future Directions

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ARTICLE INFO

ABSTRACT

This paper offers valuable information on the implementation and practicability of Green Supply Chain Management (GSCM) strategies in HEIs in terms of procurement, environmental disposal, power utilization, and people involvement. Empirical research based on the current literature and case studies reveal the benefits, risks, and tactics of GSCM in the current business environment. For instance, Stanford University's Zero Waste Program achieved an ambitious goal of 80% waste reduction in 2005; MIT deployed solar panel systems that led to a decrease in energy expenses by a quarter. As the study also shows there are factors that limit or act as barriers to implementing the strategies such as financial limitations, lack of awareness, people's resistance to change, inadequate infrastructure and legal frameworks. To overcome the above, HEIs are urged to diversify their funding strategies, ensure they provide a holistic education and write all inclusive policies. There are four research avenues for future research: The first is to conduct longitudinal studies that can assess the sustained effectiveness of GSCM strategies, the second is comparisons that would compare GSCM in different parts of the world, the third is an investigation into the effectiveness or otherwise of embracing new technologies to improve on GSCM practices. The study offers important implications of the practice to the administrators of the HEI, policy makers and scholars namely, commitment, education and innovation as some of the key areas that would aid in enhancing GSCM. Through such practices, HEIs can play a meaningful role in enhancing global sustainability, optimizing managerial processes within HEIs, and facilitating cultural changes within society.

Keywords: Green Supply Chain Management, Higher Educational Institutions, Sustainability, Waste Management, Energy Efficiency

I. INTRODUCTION

Green Supply Chain Management (GSCM) has taken central stage in as a critical tool for directing sustainable resource management across the supply chain within organizations. Derived from the larger conceptual framework of supply chain management, GSCM incorporates environmental considerations into classic supply chain strategies and covers issues related to product design and development, supply of materials and other inputs, manufacturing, delivery and distribution of the final product and end-of-life disposal of the product once it has served its useful life [1]. Again, the goal is to reduce harm to the environment while at the same time increasing economic benefits as well as competitive edge. Similar to other research, this study acknowledges

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Book chapter

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CONTENTS

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5

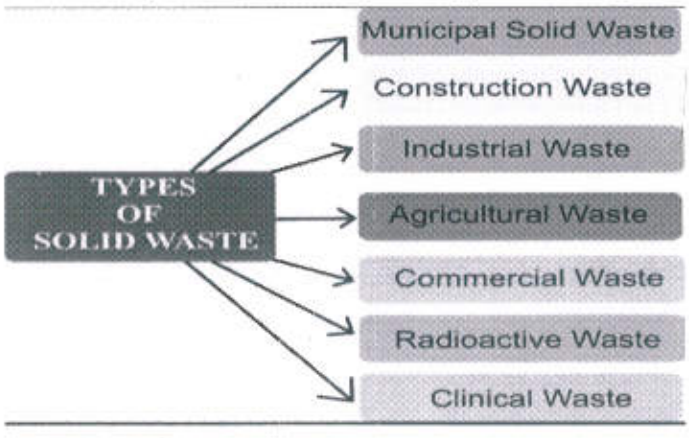
Review on Solid Waste and Solid Waste Management

Medha Babel*

Introduction

Solid waste material is defined as a discarded material which is generated by human activities in commercial, industrial and residential areas. Waste is also defined as any product which is useless to the producer [1]. The people want to dispose of the solid waste materials [2]. Solid waste materials are non-liquid and insoluble materials. These solid waste materials are responsible for water pollution, air pollution etc. Product packaging, paint cans, kitchen refuse, clothing, bottles are some examples of organic and inorganic solid waste materials. A maggot growth can be placed in cities and consumption centre due to the solid waste such as fruits, plant products and domestic waste [3] which are dumped in open air and has heat & moisture which are the reason of growth of maggots inside the waste material.[4]

The solid waste materials show adverse effects on human health and also affects the sustainability of environment and responsible for several diseases, infection, fever, typhoid etc. Waste material also overseeing for climate changes due to rising in temperature and contribution of greenhouse gases. These affects the people with cardiovascular problems and respiratory problems.[5]



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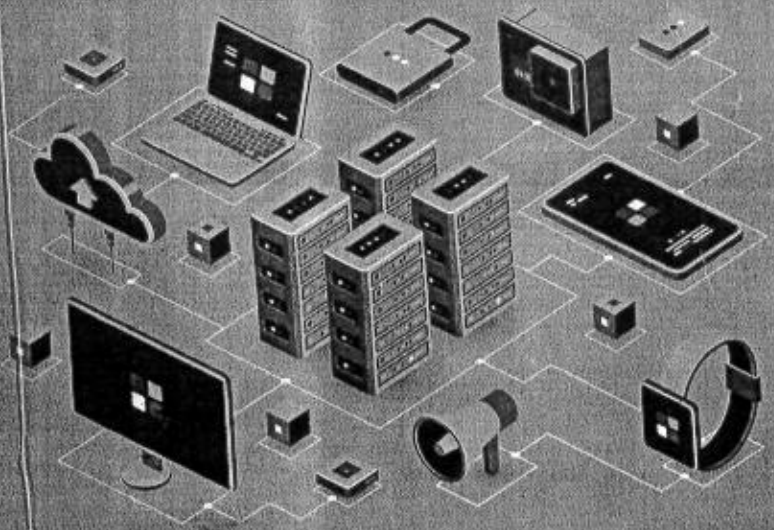

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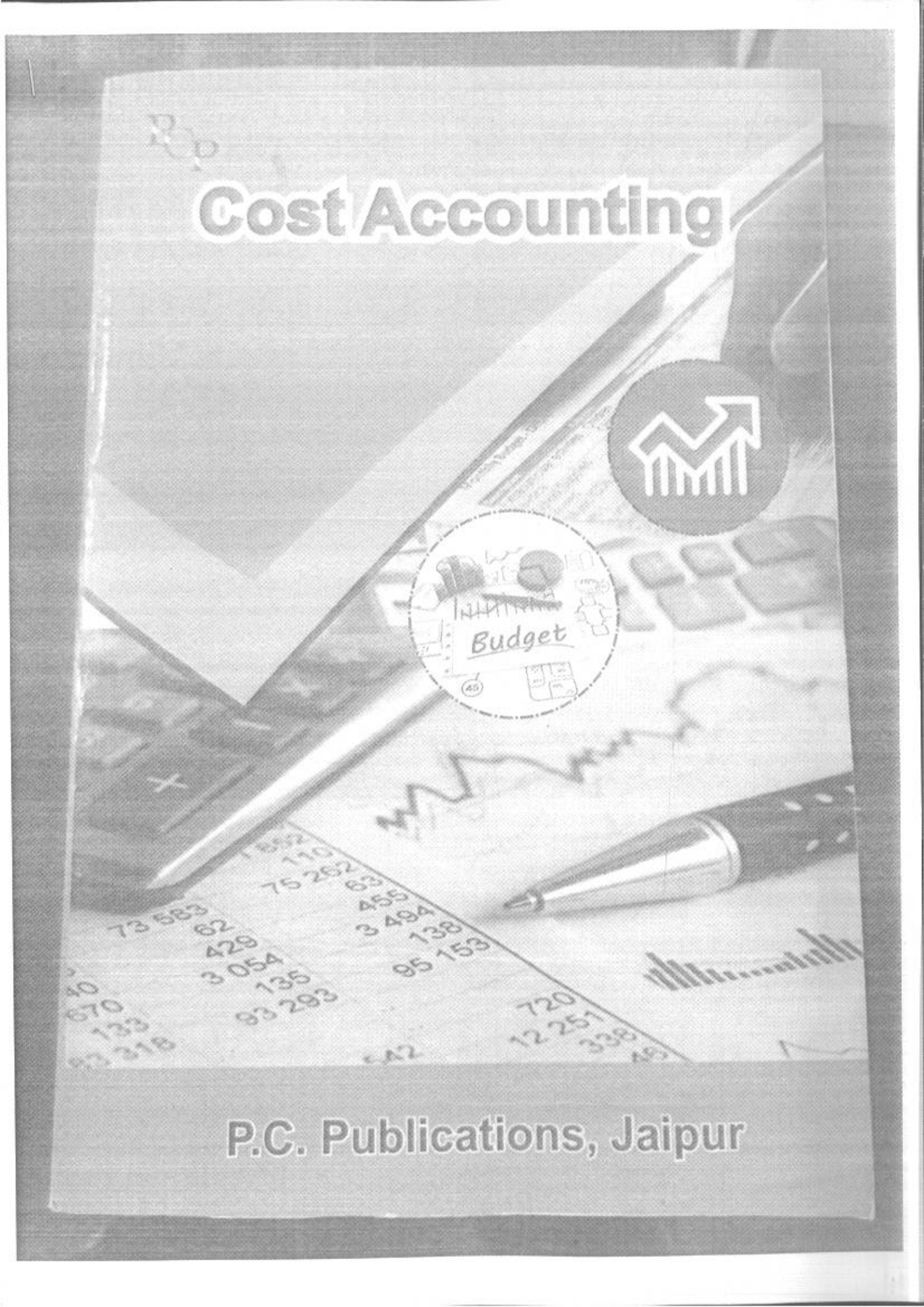

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This book revolves around the extensive empirical studies carried out worldwide to uncover the intricate web of factors that shape access to and utilization of financial services. It underscores the nuanced nature of these determinants, highlighting the social, political, structural, and economic intricacies that distinguish one nation from another. In light of this, the book strongly advocates for region-specific research aimed at pinpointing the root causes of financial exclusion and devising tailored strategies to combat it effectively.

The primary impetus for this research lies in the striking correlation observed in India, where financial inclusion witnessed a substantial 24% surge between 2017 and 2021, closely paralleling the rapid growth of digital payments facilitated by a diverse array of digital payment gateways. This link between financial inclusion and digital payments is of paramount importance, especially given three noteworthy trends in the Indian context.

First, there's the remarkable expansion of financial inclusion driven by digital payment methods and government initiatives. This correlation is poised to revolutionize the financial landscape. Secondly, the book acknowledges the transformative role played by the coronavirus pandemic in catalyzing the digital payments industry in India, while many other sectors struggled. Lastly, India's ascent to the third position globally, after the USA and China, in the number of unicorns, is attributed partly to the growth of digital payments and increased financial inclusion.

The book likely examines this intricate interplay, shedding light on the factors that foster a vibrant start-up environment and drive the emergence of unicorns in India. This research holds substantial implications for policymakers, investors, and entrepreneurs seeking to leverage India's evolving financial landscape.

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FINANCIAL INCLUSION, DIGITAL PAYMENTS AND THEIR IMPACT ON VENTURE SEED FUNDING IN INDIA

DR. RANJULA JAIN

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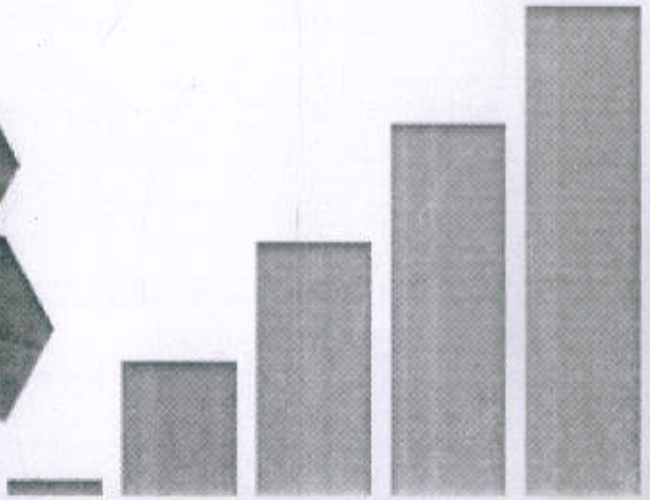

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Contents

Chapter 2

Voices from the Margin: Dalit Feminism in Bama's *Sangati Events*

Dr. Swatti Dhanwni

ABSTRACT

Untouchables are a group of people who are ostracised in Indian society and considered to be low-caste people out of the caste system. The term 'untouchable' and its practice were declared illegal yet the practice prevails in the country. For a very long time, the voice of the Dalit women has been silenced. Dalit women are challenged by issues like gender bias, domestic violence and patriarchy. Bama's second novel *Sangati Events* articulates the pain Dalit women go through because of being a Dalit and a woman. This paper attempts to analyze the lives of Dalit women, who face various challenges especially gender discrimination and yet remain undefeated. Bama's work is experimental in terms of plot and turns into a Dalit feminist work. It also explores how the voice of Dalit women are brought together collectively by the author making it a work of Dalit feminism.

Keywords: Dalit women, Patriarchy, Gender discrimination, Feminism.

The term 'Dalit' originates from Marathi meaning 'grounded', 'suppressed', 'crushed' or 'broken to pieces'. It was Mahatma Jyotiba Phule who first used the term 'Dalit' in the nineteenth century. Later the term was replaced by terms like 'Scheduled Castes' and 'Scheduled Tribes' in the Indian Constitution. Dr. M.S. Wankhede in the essay "Issues of Varna and Caste: The Source of Dalit Literature" writes that in the present context the term 'Dalit' encompasses all people who are oppressed, downtrodden and exploited by the authority and are "victims of hegemonic power" (19). The term is now used for all those who were historically marginalized and oppressed. Dalits were regarded as belonging to low-caste in Hindu social hierarchy and were denied basic rights like education and land ownership and were treated with cruelty by the upper-caste people. The Dalit Panther Manifesto defined 'Dalit' as "a member of Scheduled Castes and Tribes, neo-

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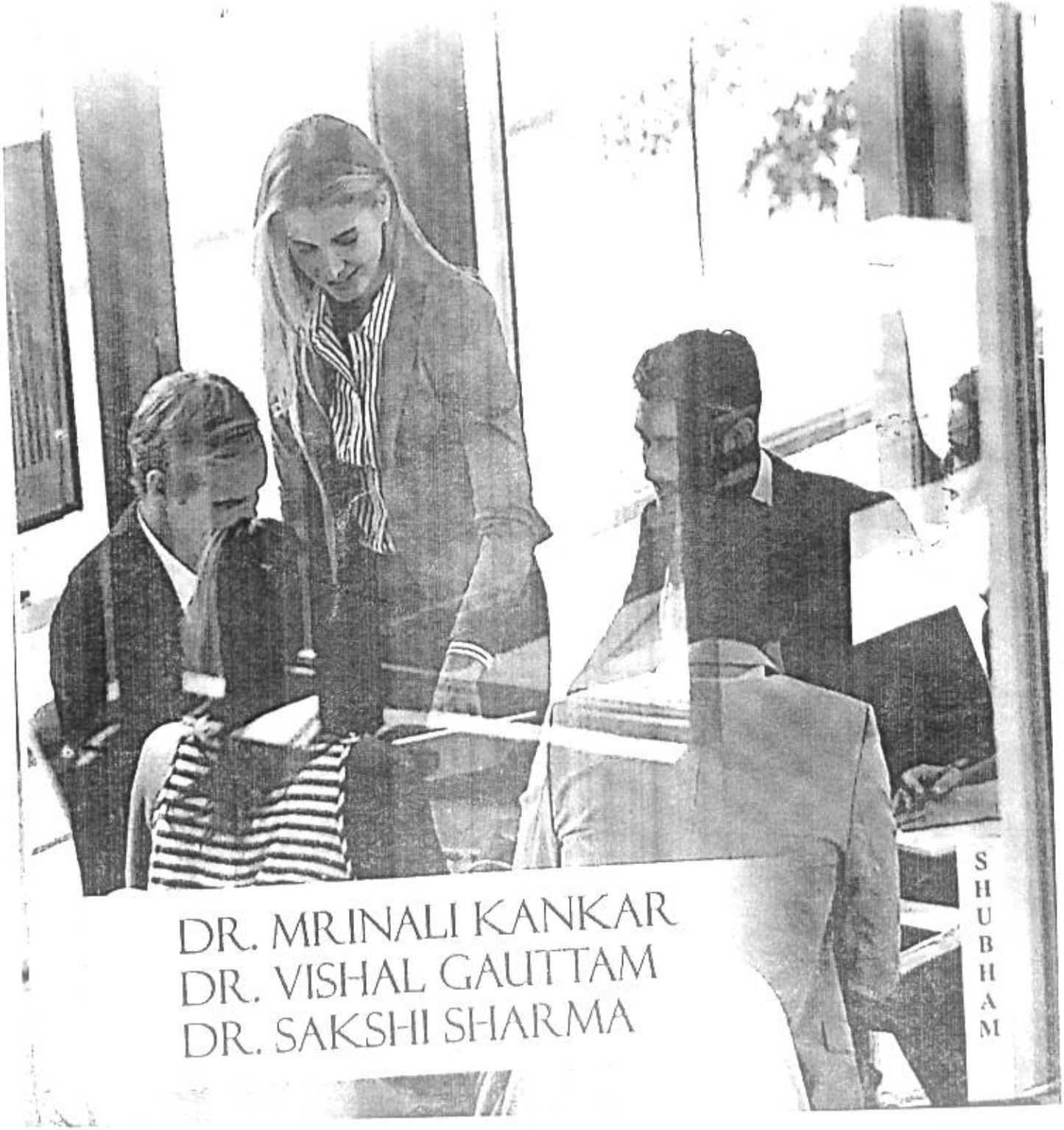

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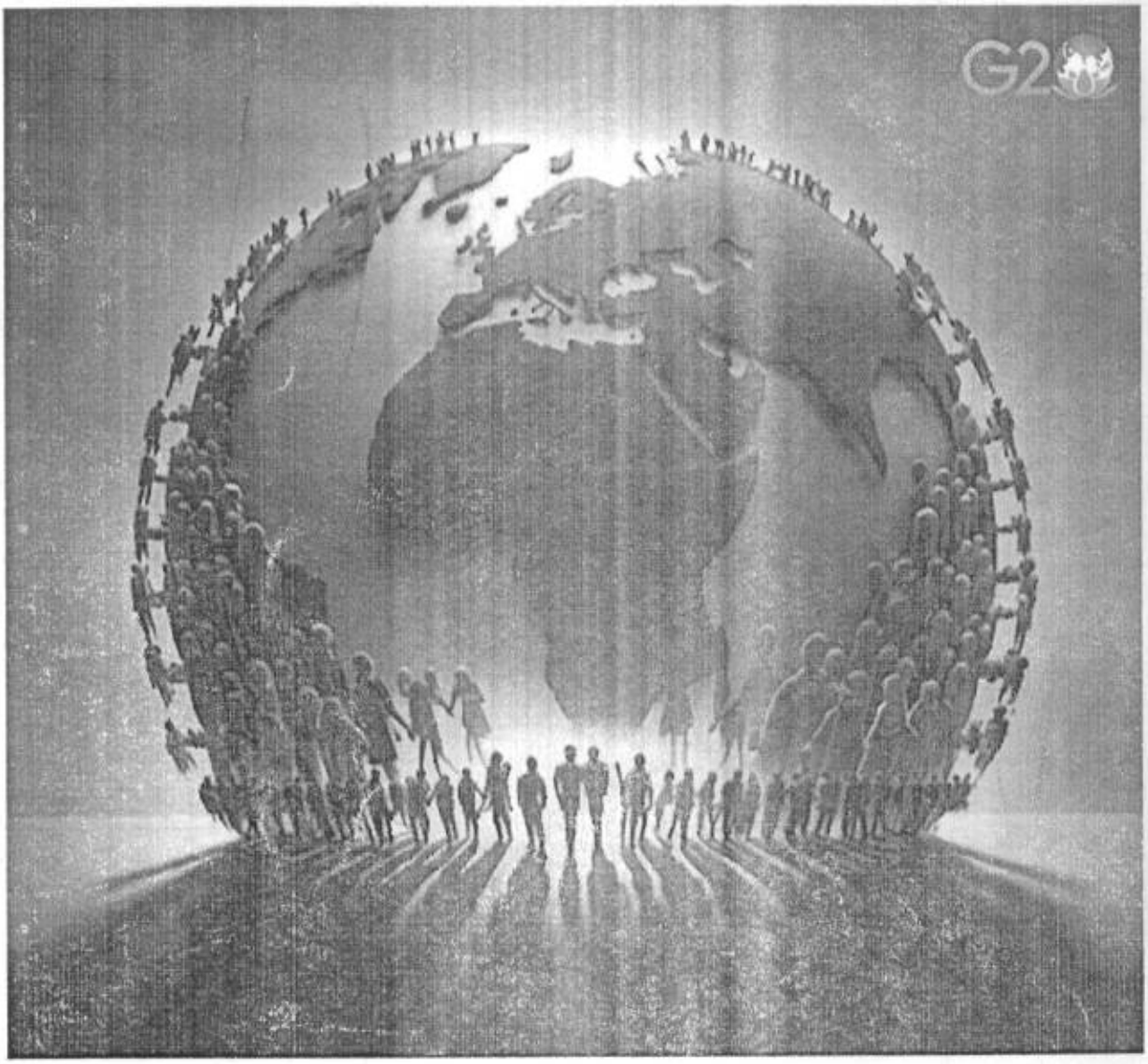

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Financial Inclusion Initiatives in G20 Nations: Progress and Challenges

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Abstract

Financial inclusion has emerged as a key focus within the G20 nations, encompassing diverse initiatives aimed at providing individuals and businesses with accessible and affordable financial services. Across G20 nations, remarkable strides have been made in fostering financial inclusion. Successful case studies, such as India's Pradhan Mantri Jan Dhan Yojana and China's innovative digital payment platforms, underscore the positive impacts on banking penetration and rural financial access. Indicators of progress include the increased adoption of digital financial services, expanded banking services, and enhanced financial literacy. However, formidable challenges persist. Regulatory complexities, the need to balance innovation with consumer protection, and addressing the digital divide are ongoing hurdles. Bridging socio-economic disparities and overcoming cultural barriers remain crucial for reaching underserved populations.

Global cooperation emerges as a key theme, with G20 nations recognizing the importance of collaborative efforts. Information sharing, the exchange of best practices, and joint initiatives for cross-border financial inclusion contribute to a more cohesive global financial landscape. Looking ahead, the article outlines anticipated trends, including the integration of advanced technologies and the rise of sustainable finance. Recommendations emphasize regulatory harmonization, digital infrastructure investment, and tailored financial literacy programs. This article explores the progress and challenges associated with financial inclusion initiatives within the G20 nations,

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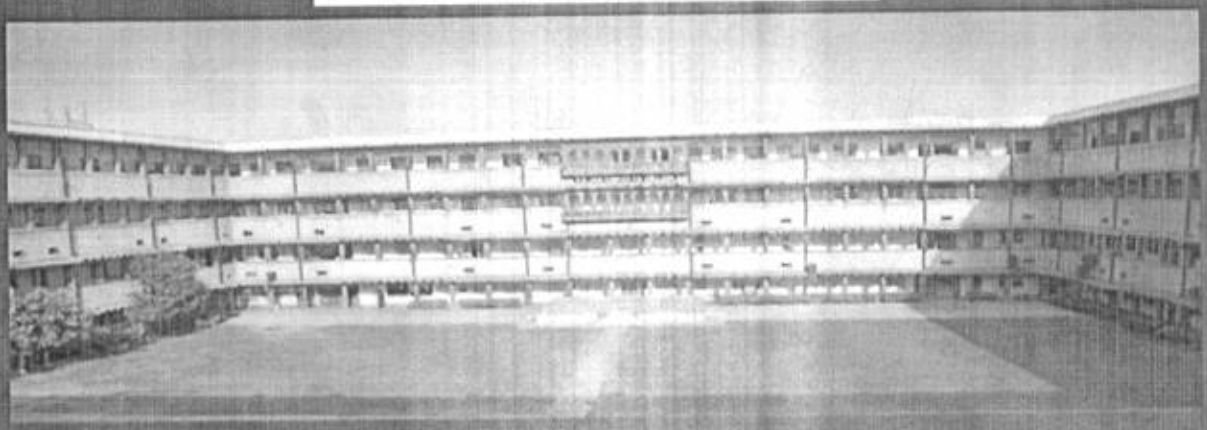

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GRAPHENE QUANTUM DOTS AND THEIR BIOMEDICAL APPLICATIONS - A REVIEW

Siddhi Jain, Dr.Nidhi Agnihotri*

Department of Chemistry, Kanoria PG Mahila Mahavidyalya, Jaipur, Rajasthan, India

**Corresponding email id – nidhi.a@kanoriacollege.in*

ABSTRACT

From past many decades, numerous amount of research has been carried out about Graphene and its derivatives. Graphene which is technically only a single layer of carbon atoms tightly bounded in a honeycomb lattice shows some unique properties due to delocalized electrons. It exhibits many outstanding features like high conductivity and excellent mechanical strength but still faces some obstacles in order to reach industry. Fortunately, with the discovery and preparation of Graphene Quantum Dots have immensely helped to overcome the hurdles

.GQDs are graphene nanofragments with size less than 10nm and thickness of less than 2nm. Graphene quantum dots are a relatively new class of material, which are derived from both carbon dots (CD) and Graphene.GQDs are basically zero dimensional substances having extraordinary chemical, structural, electrical and tunable optical properties of photoluminescence and electro-chemiluminescence. Moreover, GQDs possess chemical inertness, excellent biocompatibility and non-toxic properties of graphene.

GQDs have been accepted for the advancement of fast and multifaceted optical based environmental and biological sensors with high selectivity as well as sensitivity.Various sensing applications of GQDs have been observed ensuring the welfare of human beings and environmental stability.Biosensors subjected to GQDs have been broadly used for structured detection of biometric constituents. Apart from biological sensing,GQDs have also been extensively used for environmental sensing applications especially in concern with environmental contamination caused by heavy metals ions.In this review, we will elaborately discuss few works and applications of GQDs carried out by various Research groups around the world, specifically in the field of biomedical engineering.

1. INTRODUCTION

Today, nanobiotechnology is a pioneering technology in biomedicine. Day-to-day, new nanomaterials are synthesized with raised physiochemical properties for better diagnosis and treatment of diseases [1]. In the ever-evolving empire of nanotechnology, one remarkable innovation that has capturedthe imagination of researchers and scientists alike is Graphene Quantum Dots (GQDs), a new

Integrated Approach Across Disciplines

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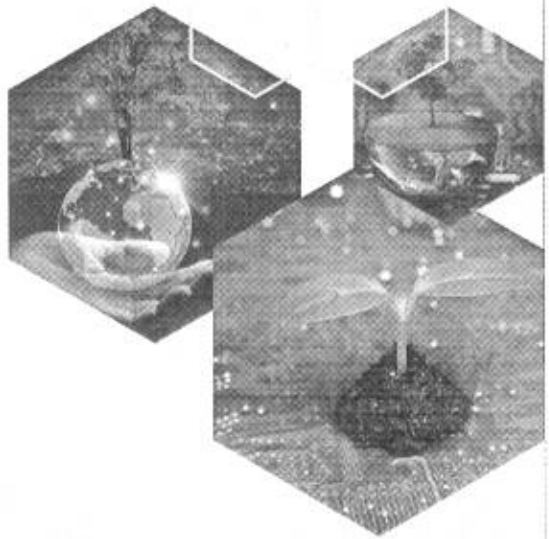

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Authored by

Ms. Nisha Saini, Ms. Rukshar & Ms. Priyanka Jangid

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Integrative Approach to Solid Waste Management: A Brief Review

Authored by

Ms. Priyanka Jangid, Ms. Rukshar & Ms. Nisha Saini

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CONTENTS

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6

Integrative Approach to Solid Waste Management: A Brief Review

Ms. Priyanka Jangid*
Ms. Rukshar**
Ms. Nisha Saini***

Introduction

One of the most important concerns in the modern world is safeguarding human civilization from the corrosive influence of artificial wastes. Wastes are, in fact, the portion of raw materials left over after their primary use and are typically undesired [1]. Solid wastes are one type of waste material that is produced in our society by diverse human activities. Solid waste is now one of the major environmental problems facing the world. Village, agricultural, municipal, and hospital solid wastes are the main categories of solid wastes [2]. A significant portion of degradable and recyclable materials are found in village wastes (VWs). However, agricultural solid wastes (ASWs) have the potential to contaminate groundwater and render soil infertile. Strong economic growth, urbanization, population growth, and rising levels of communal life have all contributed to a major increase in the world's solid waste production. The exponential increase in the human population, along with the swift industrialization and urbanization, has resulted to a massive generation of trash [3]. The World Bank project projected that urban settlements will produce about 1.3 million tones of municipal solid waste (MSW) annually by the end of 2025, a doubling of that amount. Waste creation has increased globally as a result of rapid urbanization, population growth, and economic development [4]. The combination of rising energy and material consumption rates, rapid population development, and high living standards results in significant amounts of municipal solid waste output, which, if improperly disposed of or recycled, poses major environmental risks[5].Two new issues that are harmful to sustainability and environmental preservation are industrial

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development and urbanization. Solid waste management and disposal represent a global challenge. Due to their expanding populations, rising living standards, changing lifestyles, and increasing rate of trash generation—which raises the amount of land needed for waste disposal—developing countries are particularly affected by this problem [6].

The need for solid waste management arises when a civilization shifts from an agricultural one with a low population density and a wide distribution to an urban one with a dense population. The decentralized method of solid waste management (SWM) is mostly determined by each nation's economic standing [7].It involves a number of activities pertaining to the creation, preservation, gathering, transportation, processing, and disposal of solid wastes. Regardless of the location or nation, the first stage in every waste management strategy is monitoring the creation of waste. Because there are several interrelated processes involved in waste management, as well as highly changeable demographic and socioeconomic aspects affecting the overall systems, these processes include complicated operations and non-linear parameters [8]. Eco-friendly methods of mitigating the toxicological endpoints of these pollutants on environmental elements, animals, and plants have been described. A few more distinct remediation strategies, which have been reported for waste management, include microbial-mediated biodegradation, membrane bioreactors (MBRs), anaerobic ammonium oxidation, advanced oxidation processes (AOPs), phytoremediation [9]. Solid waste management and disposal is a global challenge. Around the world, landfilling is a common process for disposing of non-recyclable trash; however, in certain poor nations, the waste is dumped into pits or mounds rather than being covered with soil. Additionally, landfills can serve as designated locations for the disposal of municipal solid waste where recyclables can be sorted and garbage can be processed [10].

Types of Solid Waste

- **Agriculture Solid Waste**

Waste from farms, hatcheries, and woods is primarily referred to as agriculture waste. Biomass and reusable biodegradable materials are particularly enriched in these wastes. Most agricultural operations result in the production of solid waste. But it goes beyond production to include other farming and food chain-related activities [11].Significant amounts of agricultural solid waste can be produced at every stage and phase of the food chain. Agriculture waste is a major source of harmful substances that contaminate surface and groundwater. This waste is the result of over fertilizing fields when surface water eutrophication has produced excess nitrogen (N) and phosphorus (P) in the fertilizer [12]. The ecological system of an aquatic body is allegedly harmed by eutrophication consequences. As a result, it lowers oxygen levels and promotes the growth of aquatic weed, which can kill off wildlife and plants.

4

Electronic Waste Management: Issues and Strategies

Ms. Nisha Saini*
Ms. Rukshar**
Ms. Priyanka Jangid***

Introduction

The largest and fastest-growing manufacturing industry in the world is electronics. It has been significant in the socio-economic and technological growth of societies in the past several years. Equipment used for data processing, communication, entertainment, and commercial purposes makes up the majority of electronic trash, also known as waste from electrical and electronic devices [1]. The term "e-waste" refers to electronic components that have been used and are expanding quickly as a result of the increased global use of electronic items. Due to cost reductions and expanding internet usage, as well as developments in telecommunications and information technology, there is a growing requirement for electronics parts. The rapid rise in production and consumption in the electronics sector is the reason behind the increase in both the quantity and toxicity of e-waste in India [2]. Hazardous substances such as cathode ray tubes, also called cathode ray (CRTs), that consist of oxides of hazardous metals, can contaminate soil and groundwater when they are discarded. If a suitable system of management does not exist for the treatment of e-waste, it poses serious risks to both humans and the environment. Recycling electronic waste and recuperating resources are major problems due to their hazardous nature. Nevertheless, only a small percentage of e-waste is properly collected and regained; the rest is dumped in graves and transferred to black markets. E-waste is frequently imported by countries that are emerging without adequate preparation or effective management [3]. Because of this, the

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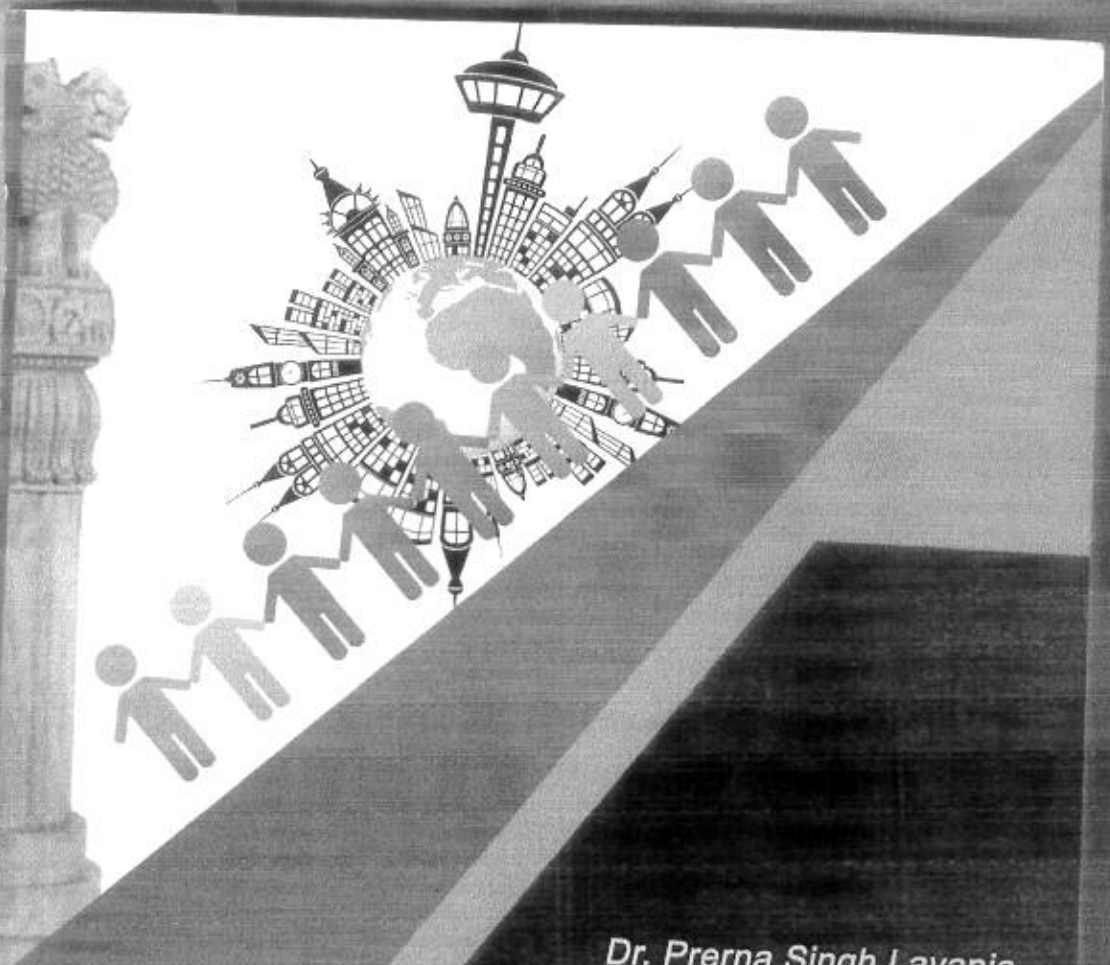

Dr. Prerna Singh Lavania

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Women's Empowerment in Present Scenario

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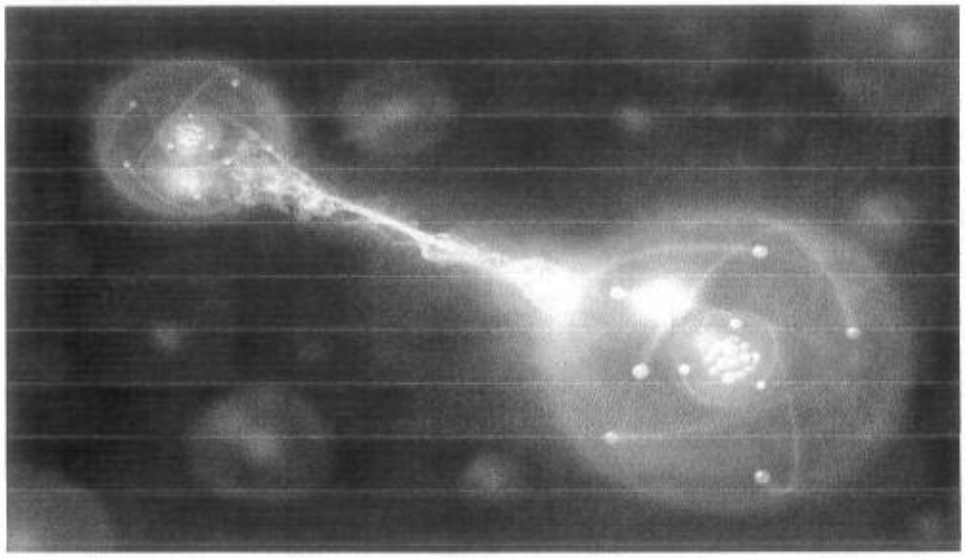

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Women's Empowerment in Present Scenario

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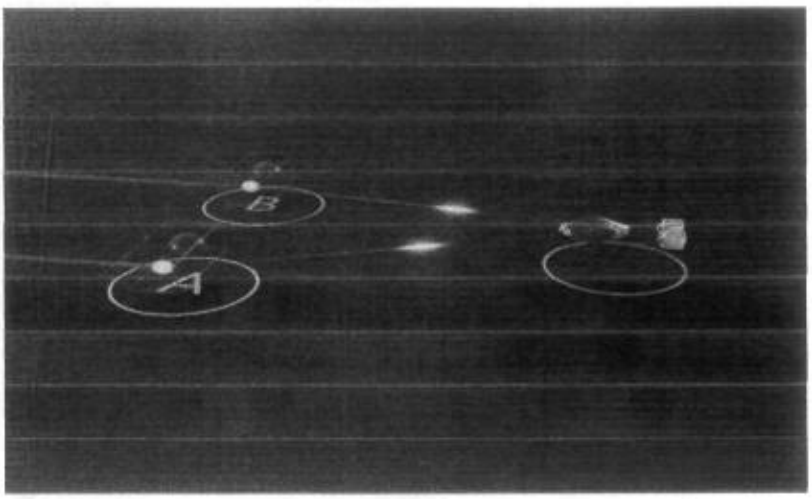

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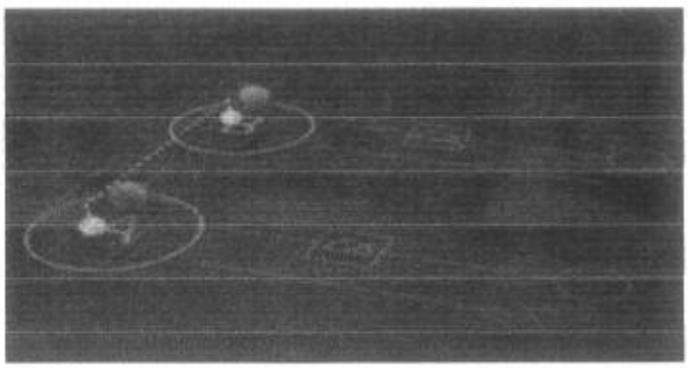

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Impact of Digitalization on Women's Empowerment

Dr. Prerna Singh Lavania

Women must be empowered to be strengthened, given access to opportunities, and given authority over their lives and decisions. Establishing a setting where women may engage in the socio-political and economic development of the country on an equal basis with men, with their opinions valued and recognized, is what is meant by this. Empowering women is vital for the nation because, without it, no nation can hope to advance politically or economically while half of its population remains behind the curve. A nation that wants to advance cannot afford to ignore the development of women's capacities and their empowerment. It's a well-known truth that any effort to raise the standard of living for the citizens of a country will be incomplete without the contribution and participation of women.

The world has seen rapid advancement in the field of science and technology. In the past few years we have noticed that our lives have been transformed in a great way, the way we think, live, and work all have an impact on technology. The positive impact of technology is seen in every aspect of life but it seems that technology has not been distributed equally women and girls have been left behind they have very limited access to digital resources and opportunities. Despite efforts to bridge the digital divide women are still unrepresented in the tech industry though there are ample opportunities for women and they can bring drastic changes and contribute to the digital economic development of the country. Technology has opened new doors of opportunities for women to participate in the digital economy, health care, education, etc Covid 19 has also shown us that remote work can be effective and suitable for women. it has been observed that digital technology is a fundamental force for change around 90% of new jobs worldwide require digital skills but 49% of the world still lacks internet access, especially women so to bridge the gap and make the

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Revolutionizing Higher Education: A Comparative Analysis of Digital Transformation in Academia

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Assistant Professor

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Abstract: The fourth industrial revolution, driven by the digitization of industries, has brought about significant changes in the corporate landscape and skill requirements. Higher education, as a fundamental pillar in fostering knowledge economies, has attracted substantial attention from national authorities, leading to a strong focus on digitalizing higher education. Education has witnessed a surge in the adoption of multimodal and digital technologies, with platforms such as blogs, social media, and videos playing pivotal roles in learning and coursework. Traditional educational approaches, including lectures and textbooks are gradually embracing these new modes of knowledge dissemination and communication within the classroom. The digital environment and global network have permeated almost every aspect of modern life, necessitating the provision of appropriate teaching aids and curricula to help schools, universities, teachers, and educators address contemporary national and international challenges related to digital technologies. This research paper presents a comprehensive roadmap for transforming conventional education systems through digitization in higher education. It investigates the increasing digitalization of higher education, the need for enhancing professional development, and the supportive tools for professional growth. By evaluating and contrasting conventional and online learning environments, the paper demonstrates the significance of digital education evaluation in shaping the future of academia.

Keywords: Revolutionizing higher education, Digital transformation, Fourth industrial revolution, Digital technology, Online learning environments

Introduction: "The true sign of intelligence is not knowledge but imagination." - Albert Einstein.

In today's rapidly evolving digital landscape, the potential for transforming higher education is immense. As the world progresses through the fourth industrial revolution, characterized by the digitization of industries, it becomes crucial to examine the impact of digital transformation in academia. This research paper aims to delve into the realm of revolutionizing higher education through a comparative analysis of digital advancements across various educational systems.

India, renowned for having one of the largest educational systems globally, faces a critical challenge of bridging the gap between education and employability. Despite the presence of an extensive network of schools, colleges, and institutions, the employability rate of graduates remains a concern. The traditional educational system struggles to keep pace with the demands of the technologically advanced twenty-first century. Recognizing the need to address these challenges and provide innovative learning experiences, policymakers, administrators, mentors, teachers, and parents must prioritize the integration of technology within education. Inspired by the vision of a digital India, as envisioned by Prime Minister

Enhancing Tourism Through Information Communication Technology

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Jayanti Goyal

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Abstract

travelers from the constraints of traditional arrangements. Online booking systems have

evolved into complex platforms that allow people to create personalized itineraries, secure lodgings, and access real-time data with remarkable ease. The shift extends to destination management, with smart destinations demonstrating ICT's transformative power. Tourism stakeholders create seamless, linked ecosystems that increase traveler safety, contentment, and engagement by integrating the Internet of Things (IoT), intelligent navigation systems, crowd management technologies, and real-time data analysis.

Digitalization replaces paper-intensive practices, lowering waste and increasing environmental awareness. The digital divide continues to be a barrier, with fair access to ICT resources remaining a top goal. Concerns about data privacy necessitate a difficult balance between technological integration and individual rights.

The chapter addresses these issues by advocating for a happy coexistence of tradition and modernity. Looking ahead, the chapter imagines a future in which artificial intelligence (AI), blockchain, and other technologies usher in hitherto unimagined realms of possibilities. Travel assistants powered by AI anticipate and answer travelers' requirements in real time, while blockchain-based identity verification protects security and speeds transactions. As the globe enters a new era of adventure, the marriage of technology and travel continues to evolve, enriching experiences and defining a future in which the limitations of potential are set only by human imagination.

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JPH's

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University of Rajasthan, Jaipur and
Pandit Deen Dayal Upadhyaya Shekhawati University, Sikar
According to the latest Syllabus of BCA Part-II

BCA Part-II
Code - 201

by

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BCA Part-II

BCA-201 : Object Oriented Programming Through C++

Question Paper pattern for Main University Examination **Max Marks:100**

Part - I (Very short answer) consists 10 questions of two marks each with two questions from each unit. Maximum limit for each question is upto 40 words.
Part - II (Short answer) consists 5 questions of four marks each with one question from each unit. Maximum limit for each question is upto 80 words.
Part - III (Long answer) consists 5 questions of twelve marks each with one question from each unit with internal choice.

Unit-I

Introduction to Object Oriented Concepts: Evolution of OOP, OOP Paradigm, Advantages of OOP, Comparison between functional programming and OOP approach, Characteristics of object oriented language - objects, classes, inheritance, reusability, user defined data types, polymorphism, overloading.

Unit-II

Introduction to C++: C++ tokens, Data types, C++ operators, Type conversion, Variable declaration, Arrays, Statements, Expressions, Conditional statements, Jumping statements, Loops, Functions, Pointers, Structures.

Unit-III

Class and Objects: Classes, Objects, Defining member functions, Arrays of class objects, Pointers and classes, Passing objects, Constructors, Types of constructors, Destructors, This pointer, Access specifiers, Friend functions, Inline functions.

Unit-IV

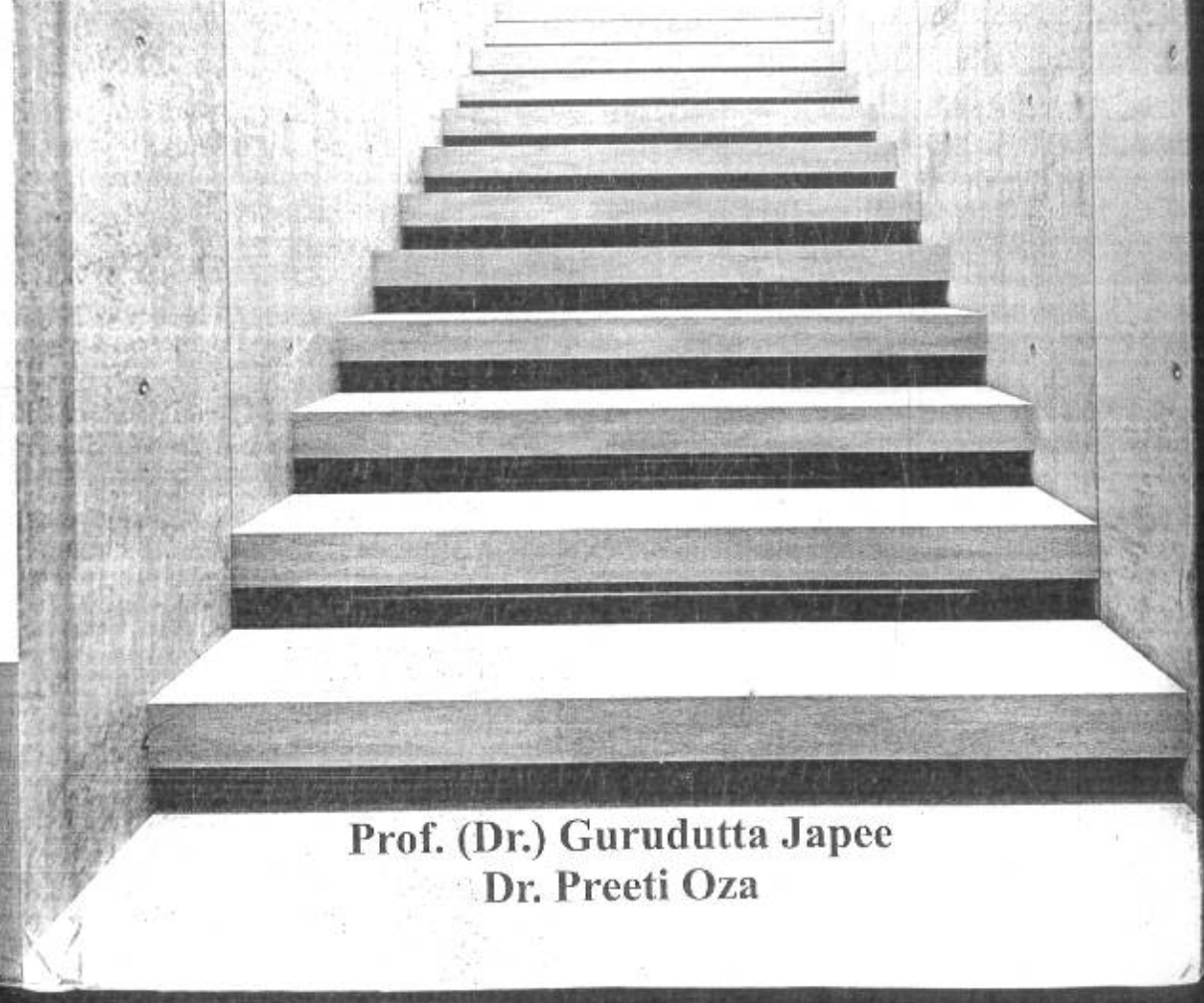
Inheritance: Introduction, Importance of inheirtance, Types of inheritance, Constructor and destructur on derived classes.

Polymorphism: Function overloading, Operator overloading, Virtual functions, Pure virtual functions.

Unit-V

File Management: Handling data tiles (sequential and random), Opening and closing of files, Stream state member functions, Operations on files, Templates, Exception handling.

Demystifying Viksit Bharat 2047



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29

HARMONY OF BITS AND BRAINS: MACHINE INTELLIGENCE IN VIKSIT BHARAT

— *Dr. Jayanti Goyal*

Abstract :

In the vibrant tapestry of Viksit Bharat, the fusion of human ingenuity and the transformative power of machine intelligence orchestrates a symphony of progress. As the country embraces the digital revolution, the symbiotic interplay between bits and brains plays out across multiple sectors. At the heart of Viksit Bharat is a strong digital backbone, a neural network of integrated technology that promotes innovation and connectivity. From smart cities to rural empowerment initiatives, technology acts as a catalyst for change. The proliferation of cellphones, high-speed internet, and low-cost devices has ushered in a new era of information democratization and urban-rural connectivity.

In agriculture, a technological ballet unfolds, optimizing farming practices and securing the nation's food future. The human touch is still important in education and healthcare, where personalized learning and AI-powered diagnostics empower people and improve public health. From urban infrastructure optimization to the accuracy of Industry 4.0 manufacturing, machine intelligence serves as a silent orchestrator of progress. It delves into the innovative

intersection of human intelligence and technology, which influences the country's course. This chapter investigates how the use of artificial intelligence in Viksit Bharat's digital revolution is transforming public services, urban planning, and administration. The chapter portrays technology as a catalyst for ecological and economic advancement, focusing on everything from the intricacies of Industry 4.0 in manufacturing to the precision of AI-powered agriculture. With a focus on the human element, it illustrates the possibilities for human-machine collaboration while highlighting the importance of individualized learning in education and AI-driven diagnostics in healthcare. Along with tackling ethical issues, the story focuses on guaranteeing inclusive innovation by tackling issues like data privacy and the digital divide.

Ultimately, it envisions a future where Viksit Bharat's harmony of tradition and technology propels the nation towards global prominence, leaving an enduring legacy of progress and inclusivity. Ethical considerations and inclusive innovation take center stage, ensuring that the benefits of technology are shared equitably. The chapter concludes by envisioning a future where Viksit Bharat continues to harmonize tradition and technology, leaving an indelible mark on the global stage.

Keywords: Viksit Bharat, Machine intelligence, Inclusive innovation, Data privacy, Digital divide.

Introduction :

In the ever-evolving landscape of Viksit Bharat, the symphony of progress is composed of the intricate harmonies between human ingenuity and the transformative capabilities of machine intelligence. As Viksit Bharat strides boldly into the digital age, the fusion of human intellect and machine precision serves as the catalyst for societal transformation. From the busy streets of its urban centers to the peaceful areas of its rural surroundings, the integration of machine intelligence permeates every facet of life, enriching experiences, enhancing efficiency, and fostering inclusivity.

This chapter explores the multifaceted role of machine intelligence across various domains, from urban planning and manufacturing to agriculture, education, and healthcare. It delves into the ways in which technology is revolutionizing governance, optimizing resource utilization, and empowering individuals to unlock their full potential. Yet, amidst the celebration of technological advancement, it also grapples with the ethical considerations and challenges that accompany Viksit Bharat's journey towards a digital future. From ensuring data privacy and combating algorithmic bias to bridging the digital divide, Viksit Bharat navigates the complexities of technological progress with a steadfast commitment to inclusive innovation and responsible stewardship.

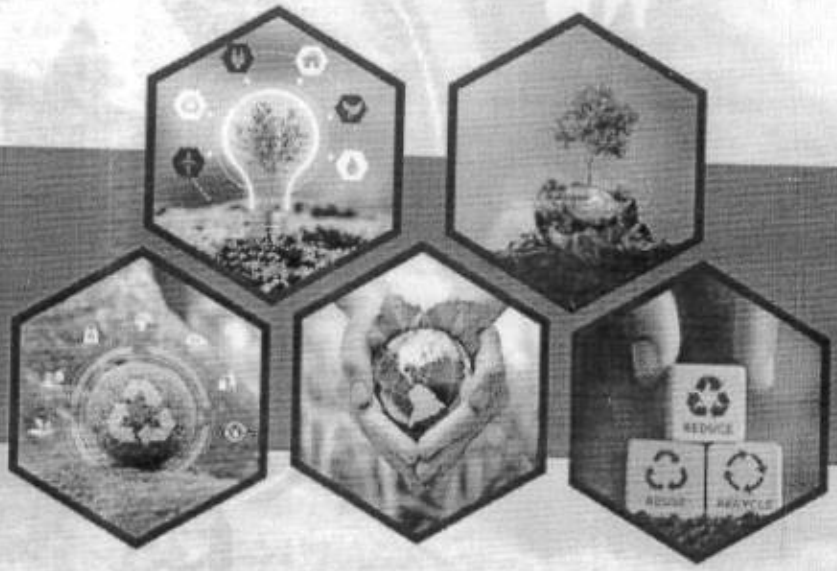
Ultimately, this chapter paints a portrait of Viksit Bharat as a nation on the cusp of greatness, where the harmonious collaboration between tradition and technology fuels a vision of progress that is as inclusive as it is transformative. As we embark on this journey through the landscape of machine intelligence in Viksit Bharat, we are reminded that the true essence of progress lies not in the bits and bytes of technology alone but in the collective brilliance of its people and the boundless possibilities of their dreams.

The digital dawn :

Viksit Bharat's journey into the digital age marks a significant turning point in its history, characterized by unprecedented connectivity, innovation, and economic growth. The proliferation of digital technologies has ushered in a new era of possibilities, transforming every aspect of society, from governance and commerce to education and healthcare. With over 1.3 billion people, Viksit Bharat boasts one of the largest and fastest-growing internet user bases in the world. According to recent data, internet penetration has surged to over 60%, driven primarily by the widespread adoption of smartphones and affordable data plans. This surge in connectivity has democratized access to information and services, bridging the digital divide between urban and rural

8,7

"REDUCE, REUSE, RECYCLE: TRANSFORMING PERSPECTIVES ON WASTE MANAGEMENT"



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INDEX

ENHANCING SUSTAINABLE DEVELOPMENT: INNOVATIVE E-WASTE RECYCLING TECHNOLOGIES

Dr. Jayanti Goyal
Associate Professor, Kanoria PG Mahila Mahavidyalaya

ABSTRACT

In the pursuit of sustainable development, the management of electronic waste (e-waste) stands as a critical challenge. In the era of rapid technological advancement, electronic devices have become an integral part of modern life, revolutionizing communication, entertainment, and productivity. However, the widespread adoption of electronic gadgets has also given rise to a pressing environmental challenge: electronic waste, or e-waste. As electronic devices become obsolete at an ever-increasing pace, the accumulation of e-waste poses significant risks to both the environment and human health.

This chapter delves into the realm of innovative e-waste recycling technologies as a means to enhance sustainable development. Highlighting the intersection of environmental responsibility, resource conservation, and technological advancement, it explores cutting-edge strategies and practices in e-waste recycling. The management of e-waste presents a complex and multifaceted problem that requires innovative solutions grounded in principles of sustainable development. This chapter is dedicated to exploring the nexus between e-waste recycling technologies and sustainable development, focusing on the role of innovation in advancing environmental responsibility, resource conservation, and societal well-being.

The chapter discusses the evolution of e-waste recycling technologies, ranging from traditional mechanical methods to advanced chemical processes. It scrutinizes the efficacy of automated sorting systems, eco-friendly disassembly techniques, and emerging nanotechnology applications in e-waste recycling. Moreover, it underscores the importance of extended producer responsibility (EPR) programs and closed-loop systems in promoting sustainable practices throughout the product lifecycle.

Beyond technological advancements, the chapter emphasizes the significance of public awareness and education in fostering responsible e-waste disposal habits. Ultimately, this exploration underscores the transformative potential of innovative e-waste recycling technologies in advancing sustainable development objectives. By embracing these technologies and fostering multi-stakeholder collaborations, stakeholders can pave the way for a more sustainable future, characterized by resource efficiency, environmental stewardship, and social equity.

Keywords: Sustainable development, e-waste, Technological advancement, Electronic devices, Recycling

Introduction

In our fast-paced digital age, the proliferation of electronic devices has transformed the way we live, work, and communicate. From smartphones and laptops to household appliances

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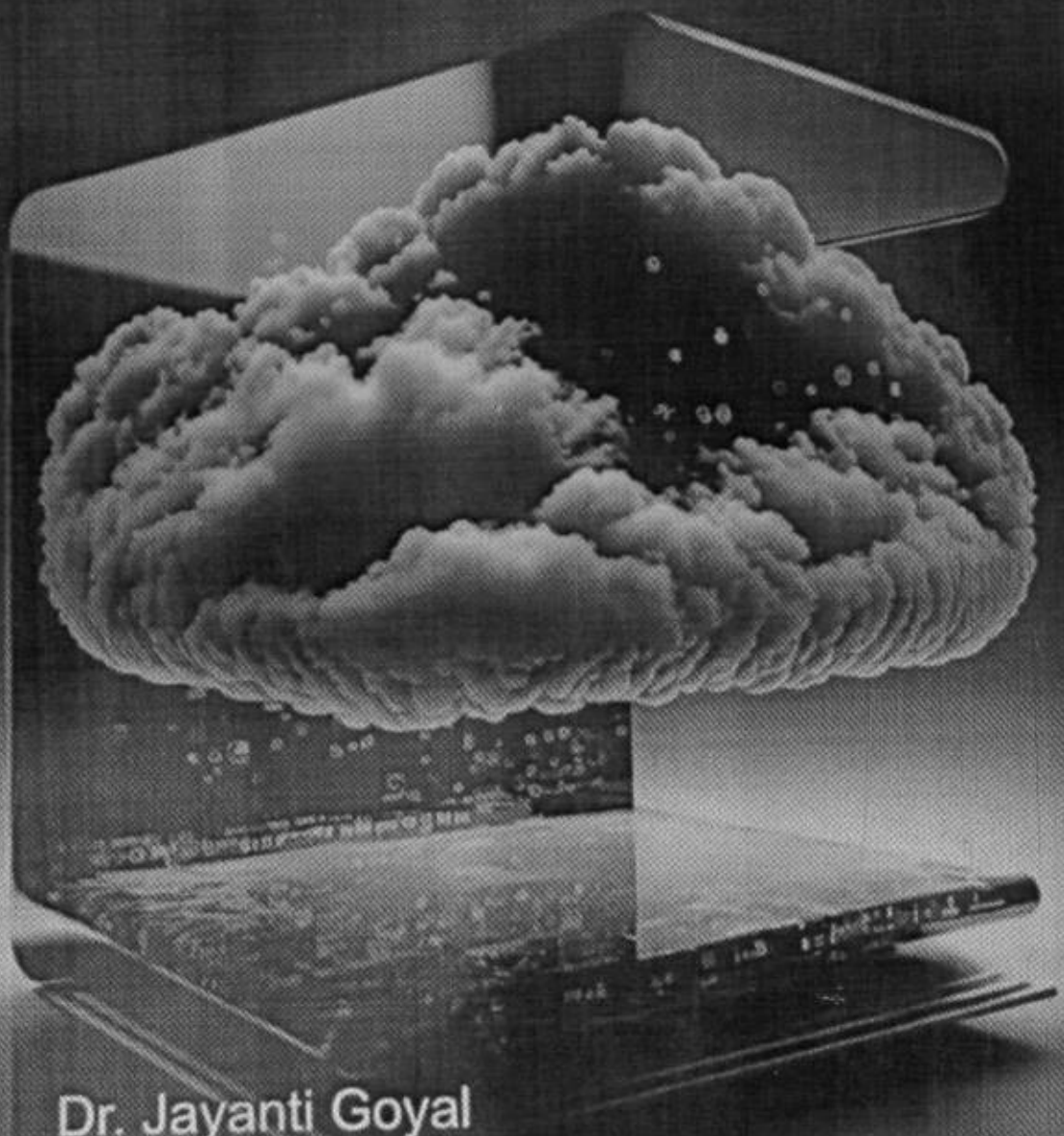

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TABLE OF CONTENT

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Abstract:

Low molecular weight (6000-7000 Da) protein- metallothioneins (MTs) having metal affinity are reported from almost all the groups of animals, some plants, microorganisms and humans. They have been localized in almost all the tissues viz. liver, kidney, intestine, pancreas, thymus, bone marrow, brain, testes etc of mammals. Commonly found in cell cytoplasm yet nuclear localization has also been observed in cells. Moreover, their concentration in tissues seems to depend upon the tissue metal concentration and developmental stages and is under the control of house keeping genes found on 16th chromosome of human beings and 8th chromosome of mice. Structurally MT is made up of two domains A and B linked by a linker region with capability of binding seven bivalent metal atoms or equivalence of this. Commonly cadmium, copper /zinc are bound though occasionally mercury, platinum, gold and silver may also bind reflecting its ability of forming contrasting thermodynamic stable and kinetic labile metal clusters. Biosynthesis depends upon several nutritional and physiological factors such as metal ions (Cu, Zn, Cd) and hormones (cytokines). Zinc deficiency has been shown to decrease MT concentration whereas induce MT biosynthesis was reported during bacterial infection, physical and inflammatory stress. Scavenging free radicals and excess of reactive heavy metal ions along with supply of copper and zinc for synthesis of metalloprotein and metalloenzyme are one of the several functions performed by MTs. They have been referred to as "metal transfer agents" due to their role in removing or depositing metal from zinc dependent proteins. Metallothioneins too have binding sites on the spermatozoal membrane both specific as well as non-specific, thus playing a biological role.

Introduction:

Metallothionein is a sulphydryl rich, low molecular weight metal binding protein that exists in almost all the tissues and is easily induced by various internal and external stimuli, including glucocorticoids, interferon, interleukin-1, progesterone, vitamin D3, endotoxins, serum factors, heavy metals, and the regulation of cellular zinc storage. MTs were initially detected in

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सर्जक की आंतरिक स्वतंत्रता को संरक्षित रखने
और
रचनात्मक धरातल पर गतिमान बनाये
रखने वाली साहसिकता
को
समर्पित।

अनुक्रमणिका

समय के सवालों से टकराता उपन्यास : 'अंधे मोड़ से आगे'*

– धर्मा यादव

वरिष्ठ साहित्यकार दीप्ति कुलश्रेष्ठ की वैचारिक यात्रा है 'अंधे मोड़ से आगे', जिसमें हर पाठक सहभागी बन सकता है। यह उपन्यास व्यष्टि से समष्टि की यात्रा करता है। इस वृहद् रचना में कोई भी घटना आरोपित नहीं लगती बल्कि विचार मंथन हेतु प्रेरित करती है।

कहानी शुरू होती है मिसेज सहाय के परिवार से, जय, अभिनव, अंकिता और मिसेज सहाय के इर्द-गिर्द घूमते घटनाक्रम को लेखिका ने इस प्रकार गूँथा है कि अनगिनत विषय इसमें समाहित हैं।

जय इसका केन्द्रीय पात्र है, जो युवा, कर्मठ, सिर पर कफ़न बाँधकर चलने वाला सजग पत्रकार है जिसके माध्यम से समसामयिक घटनाओं को इस कृति में समेटना सम्भव हो सका। जय और जय से जुड़े लोगों के विचार-मंथन से हर घटना और उनसे जुड़े कारणों को न केवल खोजा है अपितु बखूबी पाठको को झकझोरने का प्रयास भी किया है, हर घटना पर गहराई से विचार करते हुए उनका समाधान करने का सफल प्रयास भी लेखिका ने किया है। समाज का कटु सत्य सामने लाने वाले और राजनेताओं का पर्दाफ़ाश करने वाले पत्रकारों को गोली मारने वाली घटना, ग्लूकोज़ में फंगस से मर जाने वाली गर्भवती महिलाएँ, निर्भया, बलात्कार काण्ड, राजनेताओं द्वारा महिलाओं का शोषण, बुद्धिजीवियों की संवेदनशून्यता, योग से भोग की ओर बढ़ते गुरु और साधु संत तथा पुलिस की काठ जैसी छवि, ऐसी ही घटनाएँ

* 'राजस्थान लेखिका साहित्य संस्थान, जयपुर द्वारा दीप्ति कुलश्रेष्ठ को 'वाग्मणि सम्मान' से सम्मानित करने के अवसर पर प्रस्तुत समीक्षा-पत्र : दिनांक : 22 फरवरी 2015

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Histopathological alterations in the liver and kidney of rats (*Rattus norvegicus*) under the influence of fenvalerate induced oxidative stress

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Abstract:

Chemical pesticides are one of the major sources of environmental pollution. Thousands of new chemical formulations are synthesized, introduced and widely used in pest control programmes. Although the benefits associated with pest control and chemical use are many but their persistence in the atmosphere present serious health hazards. The present investigation was, therefore, conducted on albino rats (*Rattus norvegicus*) of Wistar strain to evaluate the toxic effects of fenvalerate, a type II synthetic pyrethroid insecticide, on the vital organs i.e. liver and kidney. Histopathological and biochemical alterations were noticed after oral administration of fenvalerate at the dose levels of 25 and 50 mg./kg. b. wt./day for 45 days. Parallel studies were conducted in control group. Blood was taken from heart for hematological tests. Decrease in haemoglobin content, haematocrit value and total erthrocyte count (TEC) whereas increase in total leucocyte count (TLC) was noticed after fenvalerate intoxication. Elevations of acid phosphatase, alkaline phosphatase, aspartate amino transferase, alanine amino transferase enzymes and bilirubin were recorded in the serum of insecticide treated rats. Moreover, the alterations in superoxide dismutase, catalase, glutathione reductase, hydrogen peroxide, lipid peroxidase and glutathione were found in livee and kidney, which shows the high oxidative stress in fenvalerate treated rats. Histopathological examination revealed destruction of the liver architecture, cytoplasmic vacuolation of hepatocytes and a remarkable abundance of leukocytic infiltrations. In the kidney, the renal tubules were degenerated and the glomeruli were atrophied. Thus, the obtained results collectively indicate that fenvalerate induced liver and kidney injury and produce oxidative stress in the treated rats.

Keywords: Fenvalerate, liver, kidney, oxidative stress

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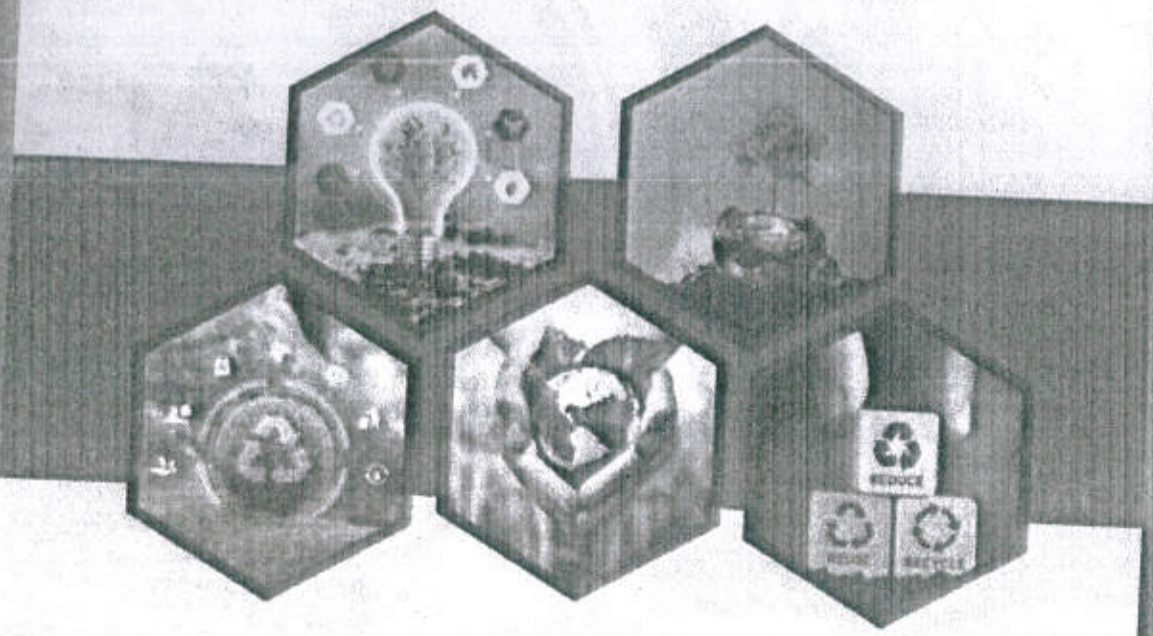
Dr. Anjanka Srivastava

"REDUCE, REUSE, RECYCLE: TRANSFORMING PERSPECTIVES ON WASTE MANAGEMENT"



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INDEX

INNOVATIVE WASTE MANAGEMENT TECHNIQUES FOR SUSTAINABLE ENVIRONMENT: A STUDY IN CONTEXT OF INDIA

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ABSTRACT

Solid waste management presents a significant challenge in India. Given its increasing population and rapid urbanization, India has been generating 150,000 metric tons of waste each day. This paper explores innovative techniques that can be implemented in the country to address this issue.

Technological advancements play a crucial role in solid waste management. India has seen the adoption of various technologies such as waste-to-energy plants, composting facilities, and biogas generation from organic waste. Other such as plasma gasification and pyrolysis can be implemented in future. These technologies not only help in waste reduction but also contribute to renewable energy production and resource recovery.

Furthermore, policy interventions and government initiatives have been instrumental in promoting sustainable waste management practices. The Swachh Bharat Mission, launched by the Government of India, aims to achieve a clean and open-defecation free India, with a strong emphasis on solid waste management.

Moreover, public-private partnerships have emerged as effective mechanisms for implementing innovative waste management solutions. Collaboration between government bodies, private enterprises, and non-governmental organizations has led to the development of integrated waste management systems, providing expertise and resources from various stakeholders.

In conclusion, innovative techniques in solid waste management are essential for addressing the growing waste crisis in India. By embracing community participation, technological innovations, policy reforms, and collective approaches, the country can move towards a more sustainable environment and cleaner future.

Keywords: Solid waste management, India, Innovation, Community-based initiatives, Technology, Policy interventions, Sustainable environment

Introduction:

Human beings have never ending needs and wants and are dependent on environment to fulfill them. All the things we use from automobiles to electronic devices, from clothes to makeup, from food to utensils are obtained from environment. But, after a period these things become unwanted and worthless for us and we throw them away. Do we take a minute to think before throwing these things away-What would happen after it becomes a waste?

It takes around 20 to 500 years for a plastic to decompose which is just one kind of waste, there are many in number. In a scenario of increasing consumption and wastage, there is an urgent need to develop such solution so that waste can be managed effectively.

In today's world, where global challenges like climate change, pollution, and resource depletion are increasing at a faster rate, so the amount of waste produced is also being increased. Effective waste management is essential for building durable and sustainable societies. Waste management plays a crucial role in today's world as it contributes to environmental protection, public health, natural resource conservation and economic benefits.

Waste management in India faces multiple challenges due to rapid urbanization, population growth, and diverse socioeconomic factors.

According to 2016 estimates, India generated about 270 million tons of annual municipal solid waste, which was about 13 percent of the global waste. This is projected to increase to 543 million tons in 2050. India has been generating 150,000 metric tons of waste per day and is among top 10 countries generating highest amount of solid waste. Increase in population and rapid urbanization have led to increased municipal solid waste (MSW). Many cities struggle with inadequate waste management including collection, disposal and transportation facilities. As a result, significant amount of waste is disposed through open dumping in landfills which releases harmful gases like methane leading to environmental pollution and public health hazards.

India has enacted several policies and regulations to address waste management, including the Solid Waste Management Rules (2016) and the Plastic Waste Management Rules (2016). However, enforcement and implementation at the municipal level vary, leading to inconsistencies in waste management practices across regions.

Despite challenges, there is growing interest in innovative waste management solutions in India. The study is conducted to find effective and most suitable methods that are innovative and sustainable in context of solid waste management in India.

Procedure of waste management:

The waste management procedure typically involves several key steps to effectively handle various types of waste.

Fig. 1.2 Waste Management Process